551.573
UN36wwa
1986-87:mr

Digitized by the Internet Archive
in 2013

http://archive.org/details/watersupplyoutlo19unit_1

551.573
Un36wwa

United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington

Washington Water Supply Outlook

January 1, 1986

The Library of the
FEB 27 1986
University of Illinois
at Urbana-Champaign

Foreward

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

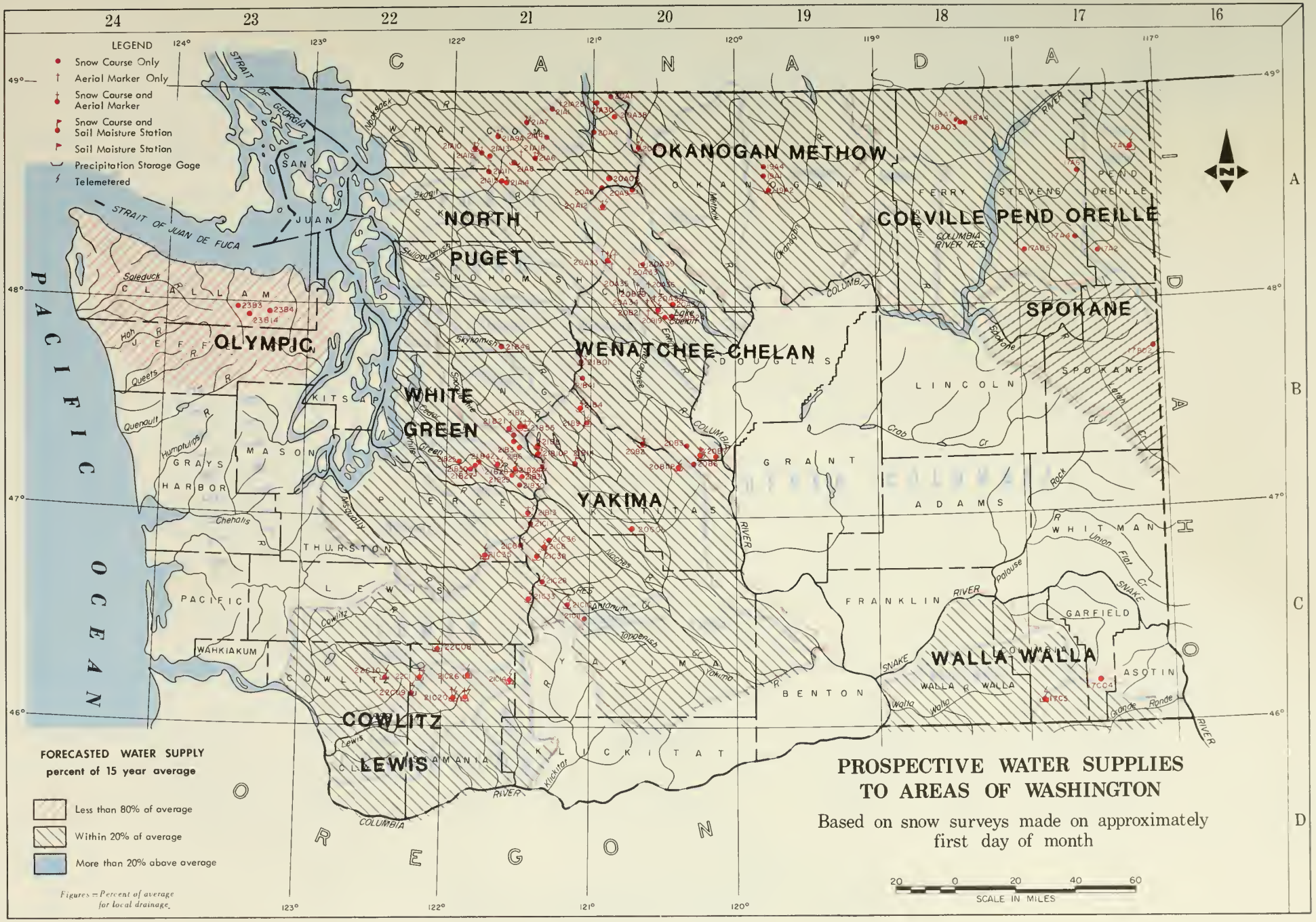
Wilson Scalling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201


PROSPECTIVE WATER SUPPLIES TO AREAS OF WASHINGTON
Based on snow surveys made on approximately first day of month
LEGEND
Snow Course Only
Aerial Marker Only
Snow Course and Aerial Marker
Snow Course and Soil Moisture Station
Soil Moisture Station
Precipitation Storage Gage
Telemetered
FORECASTED WATER SUPPLY
percent of 15 year average
Less than 80% of average
Within 20% of average
More than 20% above average
Figures = Percent of average for local drainage.
SCALE IN MILES
CANADA
OREGON
PACIFIC OCEAN
STRAIT OF JUAN DE FUCA
STRAIT OF GEORGIA
OKANOGAN METHOW
NORTH PUGET
COLVILLE PEND OREILLE
SPOKANE
OLYMPIC
WENATCHEE-CHELAN
WHITE GREEN
YAKIMA
WALLA WALLA
COWLITZ
LEWIS
WHATCOM
SAN JUAN
SKAGIT
SNOHOMISH
CLALLAM
JEFFERSON
KITSAP
MASON
GRAYS HARBOR
THURSTON
PACIFIC
WAHKIAKUM
PIERCE
KING
KITTITAS
YAKIMA
KLICKITAT
CLARK
SKAMANIA
DOUGLAS
GRANT
LINCOLN
ADAMS
WHITMAN
FRANKLIN
GARFIELD
ASOTIN
BENTON
FERRY
STEVENS
PEND OREILLE
COLUMBIA RIVER RES.
COLUMBIA RIVER
SNAKE RIVER
Grande Ronde RIVER

INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

UPPER COLUMBIA DRAINAGE

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Pend Oreille River					
Bayer Mountain	17A2	7	31N	43E	5250
Bunchgrass Meadow	17A1SP	24	37N	44E	5000
Kettle River					
Summit G. S.	1BA7	20	39N	35E	4600
Butte Creek	1BA3	28	39N	35E	4070
Goat Creek	1BA4	26	39N	35E	3595
Spokane River					
Ragged Ridge	17B02	12	27N	45E	3333
Colville River					
Baird	17A6	19	36N	42E	3215
Stranger Mountain	17A5	26	31N	38E	4990
Chewelah	17A4	11	32N	41E	4925
Okanagan River					
Muttan Creek No. 1	19A1	30	37N	24E	5700
Muttan Creek No. 2	19A4	19	37N	24E	6000
Salman Meadows	19A2SP	33	37N	24E	4500
Methow River					
Harts Pass	20A5SP	7	37N	1BE	6500
Chelan Lake Basin					
Lyman Lake	20A23SP	18	31N	16E	5900
Park Creek Ridge	20A12SP	18	34N	16E	4600
Rainy Pass	20A9SP	21	35N	17E	47B0
Mirrar Lake	20A39	30	31N	1BE	5600
Entiat River					
Brief	20B19	34	28N	19E	1600
Entiat Meadows	20A33a	28	31N	17E	4540
Entiat River Trail	20A34a	2	29N	17E	3325
Fox Camp	20A36a	17	30N	1BE	6510
Pape Ridge	20B20	22	29N	1BE	3540
Pape Ridge Snow Pillow	20B24SP	22	29N	1BE	3540
Pugh Ridge	20A32a	34	30N	18E	6725
Shady Pass	20A37	20	29N	19E	6200
Snow Brushy	20A35a	21	30N	17E	3910
Tommy Creek	20B21a	10	28N	18E	4900
Wenatchee River					
Berne-Mill Creek (New)	21B41SP	13	26N	14E	3240
Blewett Pass No. 2	20B2SP	35	22N	17E	4270
Stevens Pass	21B1SP	14	26N	13E	4070
Trough #2	20B25SP	10	20N	20E	5310
Squilchuck Creek					
Beehive Springs	20B3	12	21N	19E	4400
Stemilt Creek					
Stemilt Slide	20B6	30	21N	20E	5000
Upper Wheeler	20B7SP	30	21N	20E	4400
Yakima River					
Ahtanum R. S.	21C11	24	12N	14E	3100
Big Boulder Creek	21B9SP	35	23N	14E	3200
Bumping Lake	21C8P	23	16N	12E	3450
Bumping Lake New	21C36	13	16N	12E	3400
Bumping Ridge	21C38SP	9	15N	12E	4600
Fish Lake	21B4SP	28	24N	14E	3371
Green Lake	21C10SP	3	12N	13E	6000
Grause Camp	20B11SP	29	21N	19E	5385
Lake Cle Elum	21B14M	15	20N	14E	2200
Morse Lake	21C17SP	6	16N	11E	5400
Tunnel Avenue	21BBP	13	21N	11E	2450
White Pass (East Side)	21C28SP	2	13N	11E	4500

LOWER COLUMBIA DRAINAGE

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Asatin Creek					
Spruce Springs	17C4	9	8N	40E	5700
Touchet River					
Tauchet No. 2	17C5SP	6	7N	40E	5530
Lewis River					
June Lake	22C09SP	26	8N	5E	3200
Lane Pine Shelter	21C26SP	B	9N	7E	3800
Plains of Abraham	22C1SP	35	9N	5E	4400
Spencer Meadow	21C20SP	16	8N	7E	3400
Surprise Lakes	21C13SP	14	7N	8E	4250
Cowlitz River					
Cayuse Pass	21C6	15	16N	10E	5300
Pigtail Peak	21C33SP	11	13N	11E	5900
Patata Hill	21C14SP	36	10N	10E	4500
Sheep Canyon	22C10SP	12	8N	4E	4050
Strawberry	22C0BSP	9	10N	6E	32B0

PUGET SOUND DRAINAGE

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Nisqually River					
Paradise Park (New)	21C35SP	13	15N	8E	5500
White River					
Corral Pass	21B13SP	30	18N	11E	6000
Green River					
Airstrip	21B24P	18	20N	11E	1800
Charley Creek	21B25	27	21N	8E	1200
Cougar Mountain	21B42SP	21	21N	9E	3200
Grass Mountain No. 2	21B27	14	20N	8E	2900
Grass Mountain No. 3	21B28	12	20N	8E	2100
Lester Creek	21B29	36	20N	10E	3100
Lynn Lake	21B50	22	20N	8E	4000
Sawmill Ridge	21B31	5	19N	11E	4700
Stampede Pass	21B10SP	25	21N	11E	3860
Twin Camp	21B30	18	19N	11E	4100
Cedar River					
City Cabin	21B3	10	21N	10E	2390
Mt. Gardner	21B21P	30	22N	10E	3300
Snoqualmie River					
Alpine Meadow	21B48	31	27N	9E	3500
Olallie Meadows	21B2P	19	22N	11E	3625
Olallie Meadows East	21B55SP	20	22N	11E	3700
Skagit River					
Beaver Creek Trail	21A4	35	39N	12E	2200
Beaver Pass	21A1	9	39N	12E	3680
Brown Top	21A28a	26	40N	12E	6000
Devils Park	20A4	34	3BN	16E	5900
Freezeout Creek Trail	20A1	14	40N	14E	3500
Freezeout Meadows (New)	20A38	8	40N	16E	5000
Granite Creek	20A06	25	36N	16E	3500
Meadows Cabins	20A8	29	36N	14E	1900
New Hozomeen Lake	21A30	19	40N	14E	2800
Thunder Basin	20A07	10	35N	14E	4200
Baker River					
Dock Butte	21A11A	8	36N	8E	3800
Easy Pass	21A7A	19	39N	11E	5200
Jasper Pass	21A6A	17	38N	11E	5400
Marten Lake	21A9A	23	38N	BE	3600
Mount Blum	21A18a	27	38N	10E	5800
Racky Creek	21A12AP	20	37N	BE	2100
Schreibers Meadow	21A10AP	18	37N	BE	3400
S. F. Thunder Creek	21A14A	20	36N	9E	2200
Sulphur Creek	21A13	22	37N	BE	1600
Three Mile Creek	21A15	18	36N	9E	1600
Watson Lakes	21A8P	25	37N	9E	4500

OLYMPIC PENINSULA

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Dungeness River					
Deer Park	23B4	1	28N	5W	5200
Elwha River					
Hurricane	23B3	36	29N	7W	4500
Cox Valley	23B14	31	29N	6W	4500

LEGEND

21A7	Snow Course Only
21A7a	Aerial Marker Only
21A7A	Snow Course And Aerial Marker
21A7M	Snow Course And Soil Moisture Station
21A7m	Soil Moisture Station
21A7P	Snow Course And Precipitation Storage Gage
21A7p	Precipitation Storage Gage
21A7SP	Snow Pillow

GENERAL OUTLOOK

SUMMARY:

THE WATER SUPPLY FORECAST FOR WASHINGTON WILL BE PUBLISHED IN JANUARY FOR THE FIRST TIME. THE REPORT IS ALSO BEING PRINTED IN A NEW FORMAT THAT WILL CONFORM WITH WATER SUPPLY FORECASTS WESTWIDE.

SNOWPACK:

Washington's snowpack is below normal for January 1. Most basins are less than 80% of normal. The Baker River has 52%, the Green River 78%, and the Skykomish River is at 70%. Several areas within the state do not have any snowcourses read this report. Forcasted streamflows are for near normal to below normal flows for the summer.

PRECIPITATION:

Precipitation has varied greatly by month, with 200% of normal in many areas for October and less than 10% of normal for December in others. Some of the readings for October were 266% for Wenatchee, 204% for Yakima, 229% for North Puget and 151% for the Spokane. December was a reversal of this trend, North Puget Sound had 14%, the Olympics 19%, Colville 20% and the Yakima 33%. Water Year precipitation is now running about 75% of normal statewide.

RESERVOIRS:

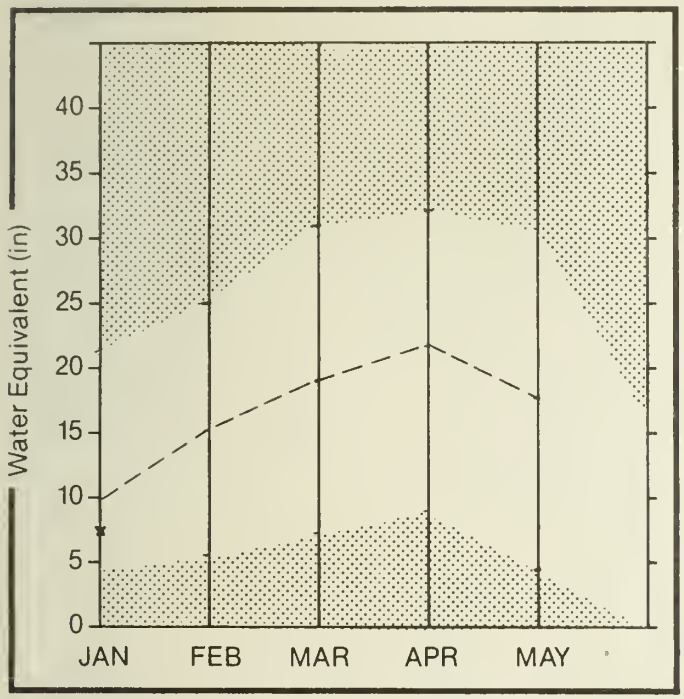
Reservoir storage is below average in the state. Storage within the Yakima River reservoirs is the second lowest in the past ten years. Banks and Roosevelt Lakes are at 71% of average.

STREAMFLOW:

December streamflow has been below normal statewide except in the Spokane River where the flow was 101% of normal. Because of ice flows most eastside stream data is unreliable. Westside streams were significatly affected by cold and dry weather. Flows in the Cowlitz were 37% of average, the Chehalis - 42% and the Skykomish at 25%. The Columbia River at the International Boundary was 82% of normal.

SPOKANE

Mountain snowpack* (inches)



*Based on selected stations

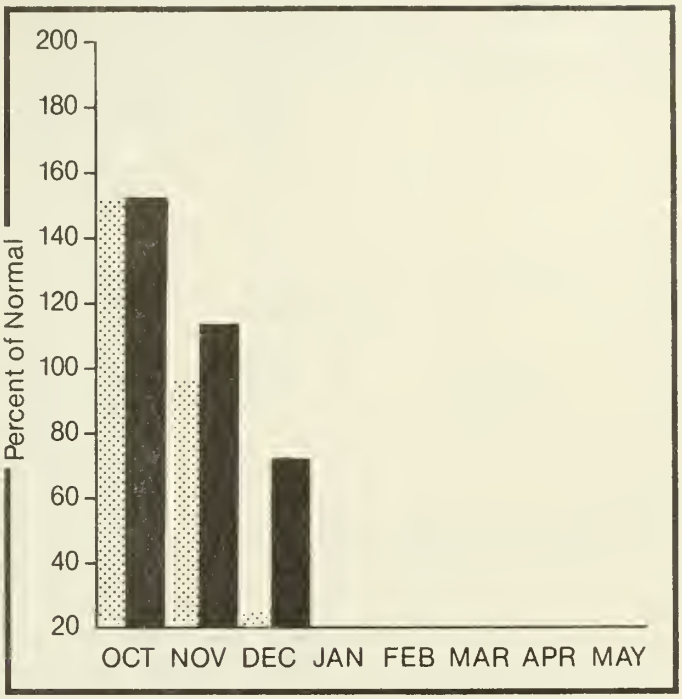
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

The forecasted streamflow for the Spokane River is below normal for the spring and summer with 77 percent. December streamflow in the Spokane River was 101% of normal. Snow cover in the 5 courses that were read was at 72% of average, but the snowcover is only 33% of that measured in 1985. Temperatures averaging 10 degrees below normal maintained the snowpack that fell in November. December precipitation was 21% of average while the accumulative water year total is 74% of average. Storage in Coeur d' Alene Lk. is 18%

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	APR-SEP	2848.0	2200.0	77.0	128.2	26.3				
	APR-JUL	2754.0	2130.0	77.0	128.4	26.3				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
COEUR D'ALENE	225.1	25.5	49.9	142.6

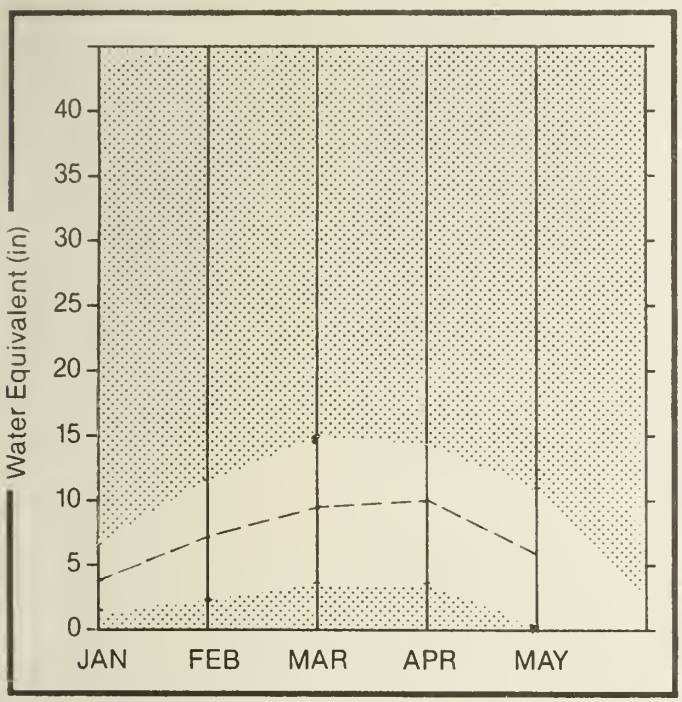
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Spokane River	10	35	71

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

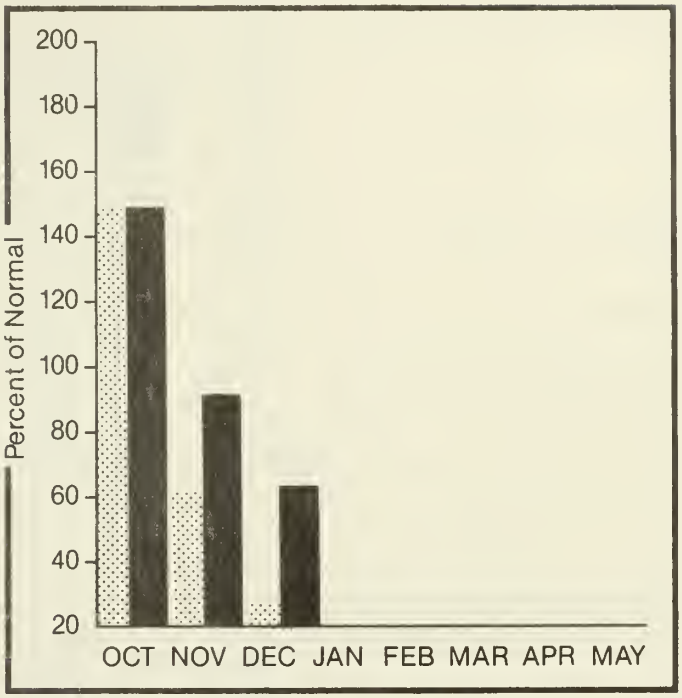
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Cold and dry has been the norm for weather in the Colville - Pend Oreille River Basins. November-December temperatures averaged 12 degrees below normal. December precipitation was at 27% of average with an accumulated water year of 63% of average. The Pend Oreille River flow for December was at 82% of normal. Snow pack for eight courses reporting in the Pend Oreille Basin was at 72% of average. Forecasted streamflow for the basin is near average with 87 percent.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	13400.0	86.0	112.9	60.9				
	APR-JUL	14156.0	12300.0	86.0	112.9	60.9				
	APR-JUN	12227.0	10640.0	87.0	113.0	61.0				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	127.0	94.0	144.8	44.8				
	APR-JUL	123.0	116.0	94.0	144.7	44.7				
	APR-JUN	114.0	108.0	94.0	144.7	44.7				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1740.0	95.0	140.1	50.1				
	APR-JUL	1738.0	1650.0	94.0	139.9	49.9				
	APR-JUN	1581.0	1500.0	94.0	139.8	49.9				
COLUMBIA RIVER at Birchbank *	APR-SEP	44605.0	41700.0	93.0	115.5	71.5				
	APR-JUL	35705.0	33400.0	93.0	115.5	71.5				
	APR-JUN	26027.0	24470.0	94.0	116.0	72.0				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	60500.0	90.0	112.5	68.5				
	APR-JUL	56169.0	50900.0	90.0	112.6	68.6				
	APR-JUN	44036.0	40070.0	90.0	113.0	69.0				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROOSEVELT	5232.0	3293.0	4889.5	4547.9
BANKS	715.0	391.0	672.2	618.3

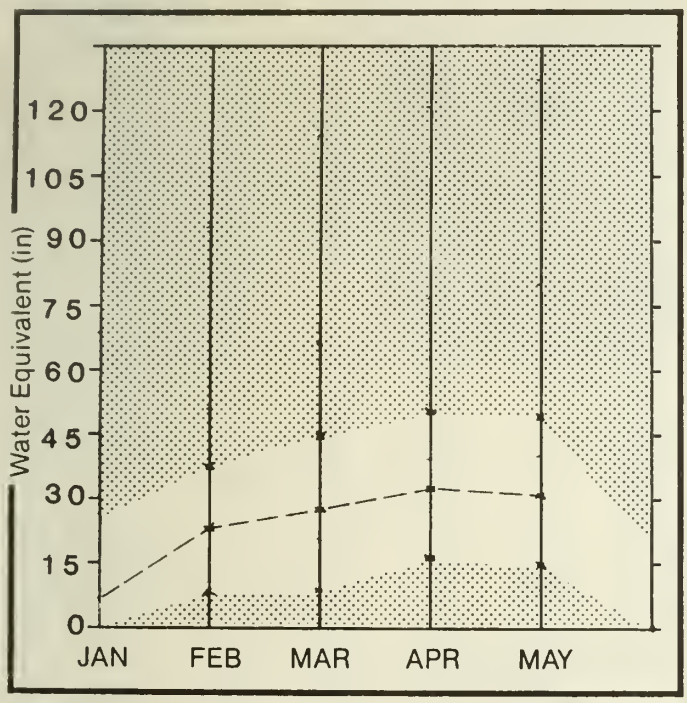
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	0	0	0
Pend Oreille River	10	40	70
Kettle River	0	0	0
Omac Lake, Twin Lakes	0	0	0
Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

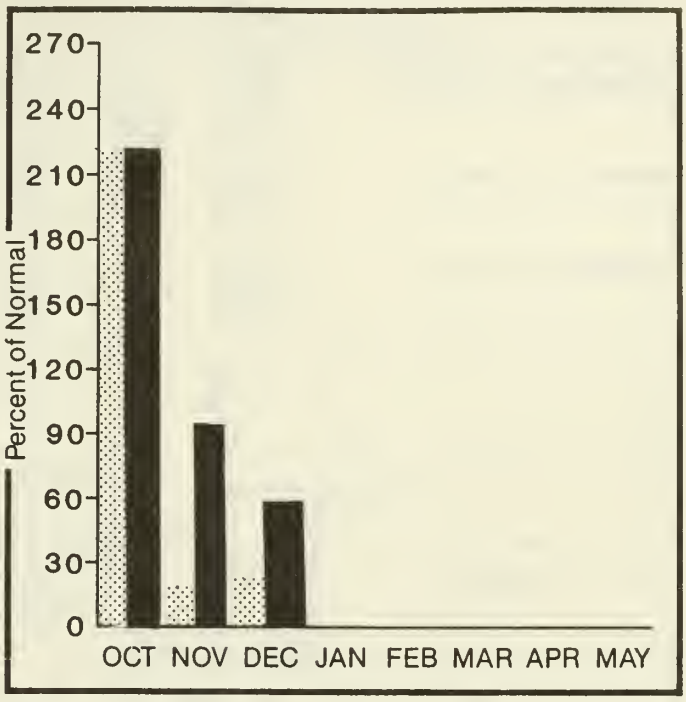
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack in the Okanogan-Methow Basins is 76% of average for the January 1 snow surveys. The cold dry trend in the weather has affected the snowpack and streamflows resulting in below average readings. December precipitation was 22% of normal. Reservoir storage is at 101% of the current 20 year average. Forecasted streamflow for the watersheds calls for near normal runoff for the spring and summer months. The Okanogan River is forecasted at 82%, with the Methow River at 85% of average.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1200.0	82.0	134.1	10.1				
	APR-JUL	1365.0	1120.0	82.0	134.1	10.0				
	APR-JUN	1161.0	950.0	81.0	133.8	9.8				
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1310.0	79.0	132.7	6.7				
	APR-JUL	1497.0	1190.0	79.0	132.9	6.5				
	APR-JUN	1262.0	1010.0	80.0	133.0	7.1				
METHOW RIVER nr Pateros	APR-SEP	980.0	833.0	85.0	119.0	51.0				
	APR-JUL	908.0	772.0	85.0	119.1	51.0				
	APR-JUN	773.0	657.0	84.0	119.0	51.0				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

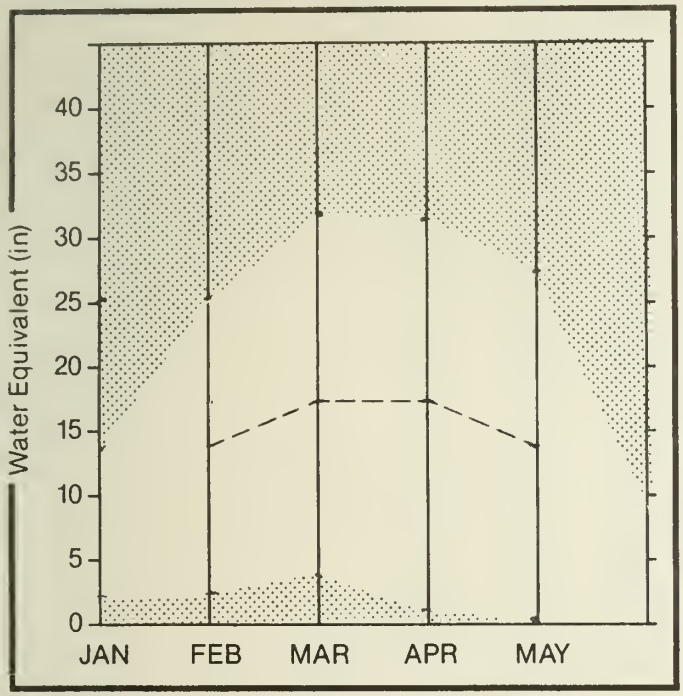
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Okanogan River	10	62	76
Methow River	2	51	67

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

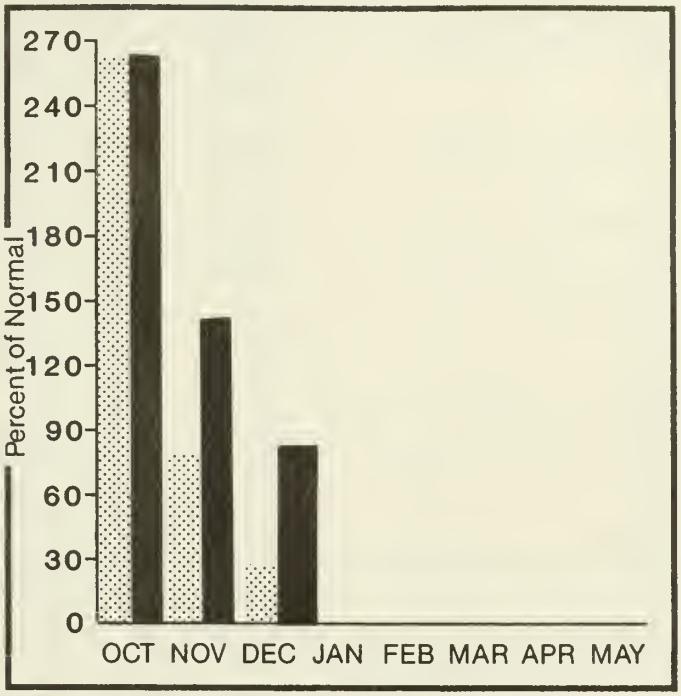
WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum — Minimum — Average — Current

Monthly precipitation — Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

The Wenatchee - Chelan Basins have 74% and 73% of snow cover at the January 1 readings. December streamflow was below average with ice fouling the stream gages. Precipitation for December was 25% of normal bringing the water year total to 84% of normal. Inflows to Lake Chelan for December were below normal due to the cold dry weather. Temperatures averaged 10 degrees below normal for November and December. Streamflows for summer will be near normal with Wenatchee at 91% and Chelan 85%.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1020.0	84.0	113.8	55.8				
	APR-JUL	1055.0	896.0	84.0	113.9	55.9				
	APR-JUN	826.0	702.0	84.0	114.0	55.9				
STEHEKIN R. at Stehekin	APR-SEP	860.0	817.0	95.0	120.0	70.0				
	APR-JUL	727.0	691.0	95.0	120.1	70.0				
	APR-JUN	553.0	525.0	94.0	119.9	70.0				
ENTIAT RIVER nr Ardenvoir	APR-SEP	234.6	211.0	89.0	89.9	89.9				
	APR-JUL	213.0	191.0	89.0	89.7	89.7				
	APR-JUN	172.0	155.0	90.0	90.1	90.1				
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1160.0	91.0	127.3	55.4				
	APR-JUL	1113.0	1010.0	90.0	126.8	54.7				
	APR-JUN	899.0	820.0	91.0	127.3	55.2				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	126.0	91.0	91.3	91.3				
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	333.0	90.0	90.0	90.0				
	APR-JUL	340.0	306.0	90.0	90.0	90.0				
	APR-JUN	270.0	243.0	90.0	90.0	90.0				
COLUMBIA R. bl Rock Island Dam *	APR-SEP	72781.0	66200.0	90.0	115.0	67.0				
	APR-JUL	61601.0	56100.0	91.0	115.1	67.1				
	APR-JUN	48384.0	44000.0	90.0	114.9	66.9				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CHELAN LAKE	676.1	365.7	---	378.7

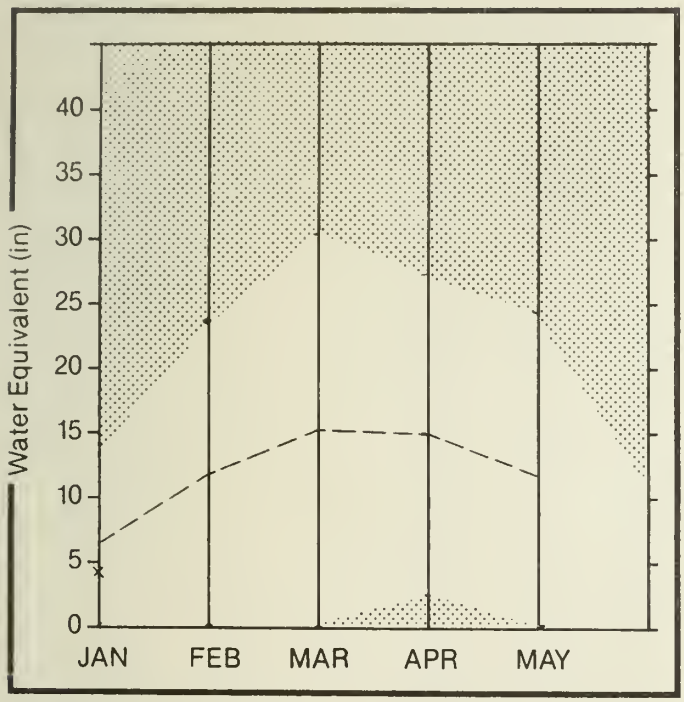
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	4	56	73
Entiat River	0	0	0
Wenatchee River	5	53	73
Colockum Creek	1	120	113
Squilchuck Creek	0	0	0
Stemilt Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

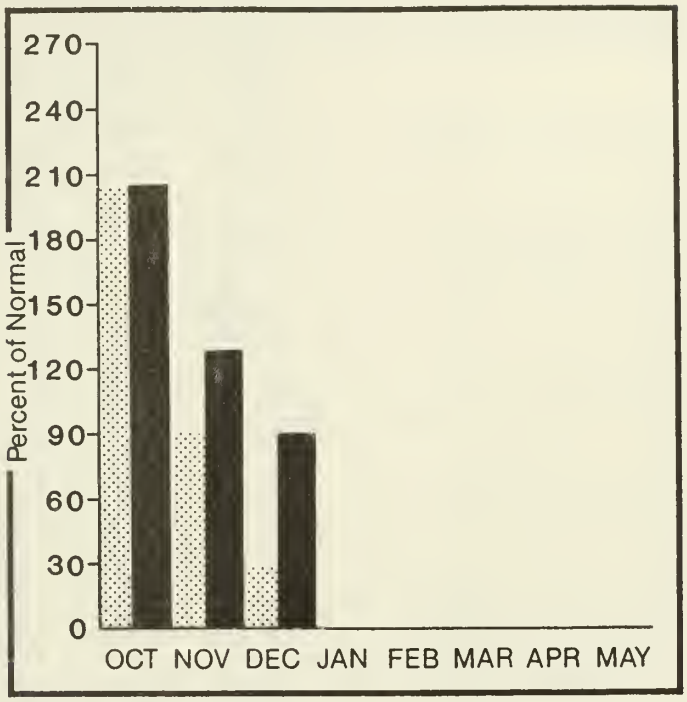
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Yakima River snow cover is 76% of normal with 13 of 28 snow courses being read for the January 1 report. Reservoir storage is 72% of normal with the reservoirs holding 403-thousand acre feet. December precipitation was 27% of average bringing the water year total down to 80% of normal. Below average temperature for November and December kept the streamflow low and caused icing problems at the gages. Forecasted flows for spring and summer are for near normal with the Yakima at 85%.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	118.0	84.0	100.7	69.1				
	APR-JUL	128.0	108.0	84.0	100.0	68.7				
	APR-JUN	111.0	94.0	84.0	100.9	68.5				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	754.0	79.0	96.0	63.9				
	APR-JUL	854.0	683.0	79.0	96.0	63.9				
	APR-JUN	734.0	587.0	79.0	95.9	64.0				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1800.0	85.0	112.9	58.9				
	APR-JUL	1898.0	1630.0	85.0	112.9	58.9				
	APR-JUN	1667.0	1430.0	85.0	112.8	58.8				
KACHESS RIVER nr Easton *	APR-SEP	121.0	99.0	81.0	99.2	64.3				
	APR-JUL	115.0	94.0	81.0	99.1	64.3				
	APR-JUN	101.0	83.0	82.0	99.0	65.3				
CLE ELUM RIVER nr Roslyn *	APR-SEP	463.0	384.0	82.0	97.8	68.0				
	APR-JUL	422.0	350.0	82.0	97.9	68.0				
	APR-JUN	353.0	293.0	83.0	98.0	68.0				
BUMPING RIVER nr Nile *	APR-SEP	142.0	122.0	85.0	114.8	57.0				
	APR-JUL	129.0	111.0	86.0	114.[illegible]	57.4				
	APR-JUN	107.0	92.0	85.0	115.0	57.0				
AMERICAN RIVER nr Nile	APR-SEP	124.0	99.0	79.0	109.7	50.0				
	APR-JUL	113.0	90.0	79.0	109.7	49.6				
	APR-JUN	94.0	75.0	79.0	109.6	50.0				
TIETON RIVER at Tieton *	APR-SEP	246.0	197.0	80.0	110.2	50.0				
	APR-JUL	207.0	166.0	80.0	110.1	50.2				
	APR-JUN	165.0	132.0	80.0	110.3	50.3				
NACHES RIVER nr Naches *	APR-SEP	867.0	736.0	84.0	116.8	52.9				
	APR-JUL	784.0	666.0	84.0	117.0	52.9				
	APR-JUN	667.0	567.0	85.0	116.9	53.1				
AHTANUM CREEK nr Tampico *	APR-SEP	47.0	34.0	72.0	117.0	27.7				
	APR-JUL	43.0	31.0	72.0	116.3	27.9				
	APR-JUN	37.0	27.0	72.0	118.9	27.0				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
KEECHELUS	157.8	59.2	84.2	83.0
KACHESS	239.0	98.1	145.0	159.1
CLE ELEM	436.9	118.5	174.4	230.2
BUMPING LAKE	33.7	4.3	3.8	6.3
RIMROCK	198.0	118.8	99.6	102.1

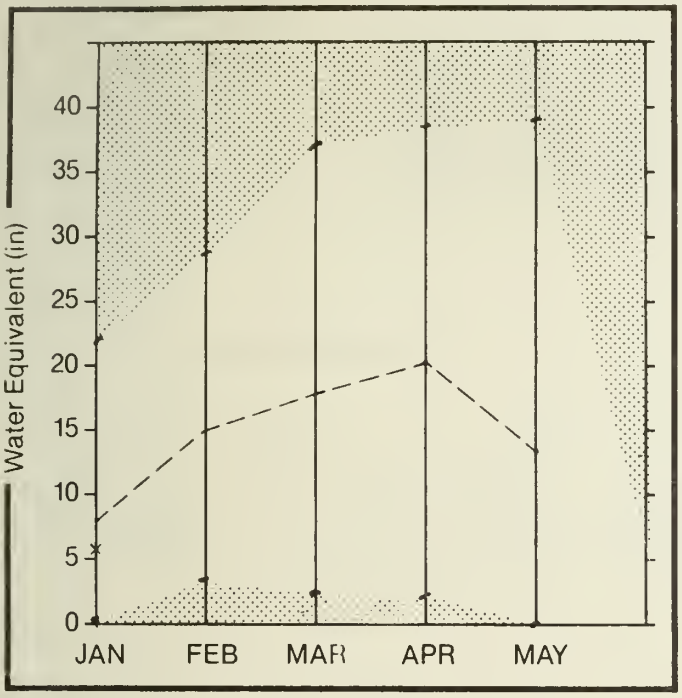
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	11	65	75
Ahtanum Creek	2	89	82

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

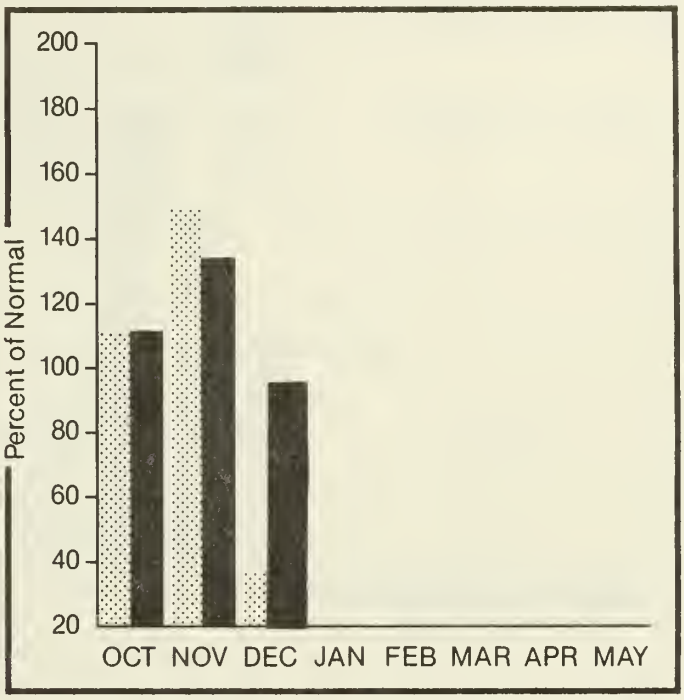
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflows for the Walla Walla Basin are expected to be near average for the spring and summer months. Precipitation was down to 37% of normal for December, but water year precipitation is at 94% of average. Snow cover for the area for January 1 was % of normal. Streamflow in the Basin was below average primarily due to the cold weather and icing of the streams. forecasted streamflows in the Walla Walla area are for 90% of average.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

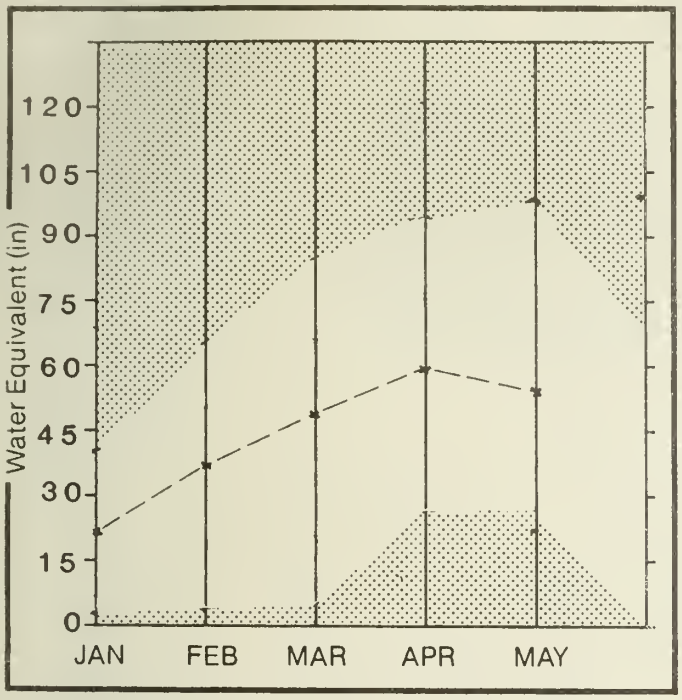
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK at Walla Walla	APR-SEP	17.5	15.8	90.0	91.4	91.4				
	APR-JUL	17.3	15.6	90.0	92.3	92.3				
	APR-JUN	17.1	15.4	89.0	87.5	87.5				
COLUMBIA R. at The Dalles *	APR-SEP	101000.0	91500.0	90.0	116.6	64.6				
	APR-JUL	86500.0	78300.0	90.0	116.5	64.5				
	APR-JUN	70100.0	63800.0	91.0	117.0	65.0				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
					Mill Creek	1	73	67

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

Mountain snowpack* (inches)



*Based on selected stations

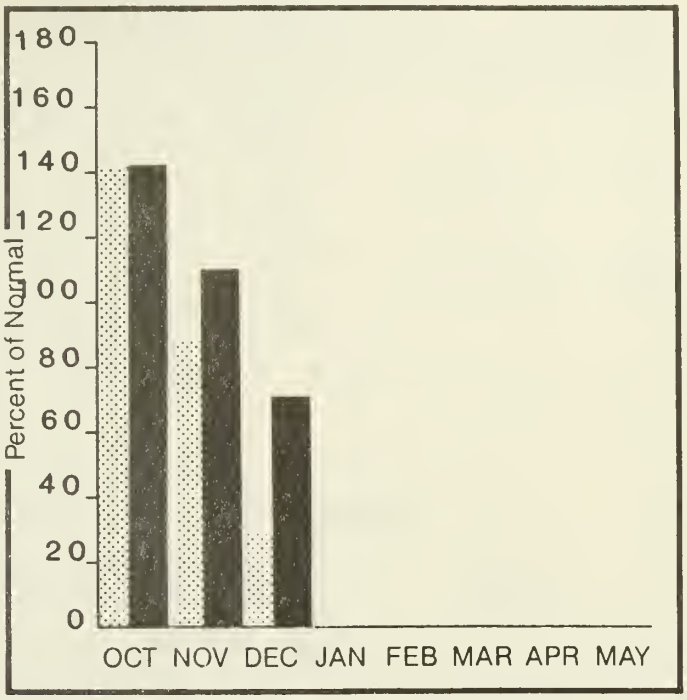
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover for the Cowlitz - Lewis Basin is at 63% of average. Streamflows are forecasted near normal for spring and summer with the Lewis River at 98% and the Cowlitz at 85%. Precipitation has been below average for December at 24% and for the water year at 71%. The cold dry weather has also reduced the areas streamflow with the Cowlitz reporting 37% of average flow for December with temperatures eight degrees below normal

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1230.0	98.0	140.5	56.4				
	APR-JUL	1086.0	1060.0	97.0	139.6	55.6				
	APR-JUN	961.0	940.0	97.0	139.9	55.8				
COWLITZ R. bl Mayfield Dam *	APR-SEP	2038.0	1740.0	85.0	130.4	40.4				
	APR-JUL	1778.0	1520.0	85.0	130.5	40.5				
	APR-JUN	1502.0	1280.0	85.0	130.2	40.2				
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2310.0	86.0	111.4	61.4				
	APR-JUL	2323.0	2010.0	86.0	111.5	61.5				
	APR-JUN	1980.0	1720.0	86.0	111.9	61.9				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

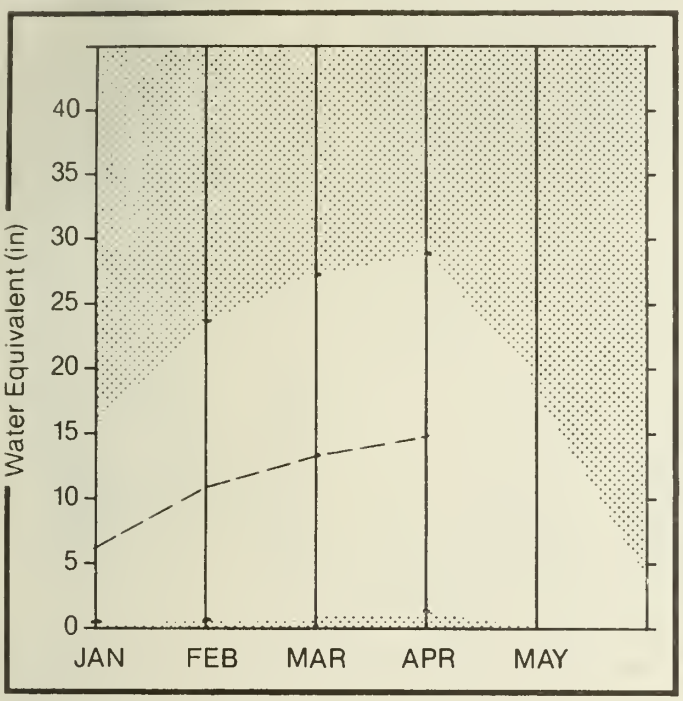
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Cowlitz River	1	48	60
Lewis River	2	39	69

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

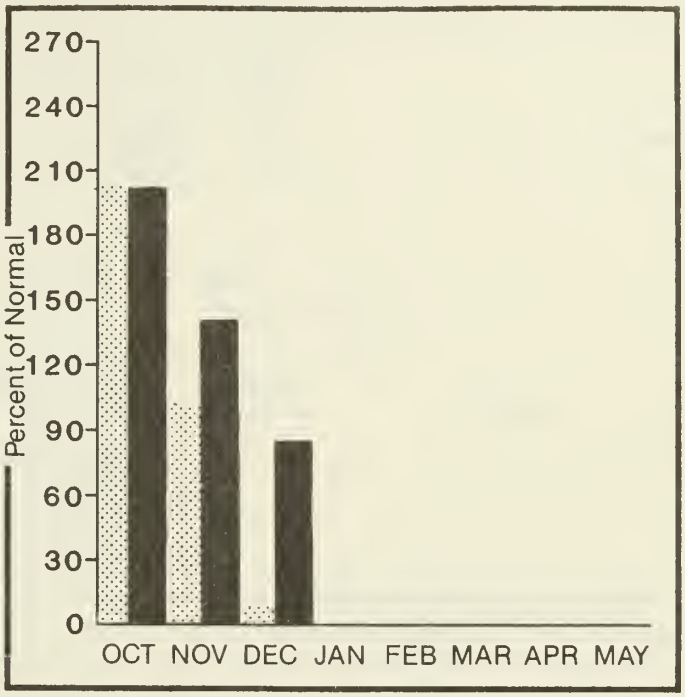
WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Summer stream flows are forecasted to be near average with the Green River at 88%. Water year precipitation has been at 85% of normal. with December at 21% November at 101%. Snowpack is at 70% of average with nine snowcourses reporting. Area streamflow for December was near 40% of average.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	252.0	79.0	79.7	79.7				
	APR-JUL	284.0	227.0	79.0	79.9	79.9				
	APR-JUN	256.0	204.0	79.0	79.7	79.7				
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	83.0	89.0	89.2	89.2				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

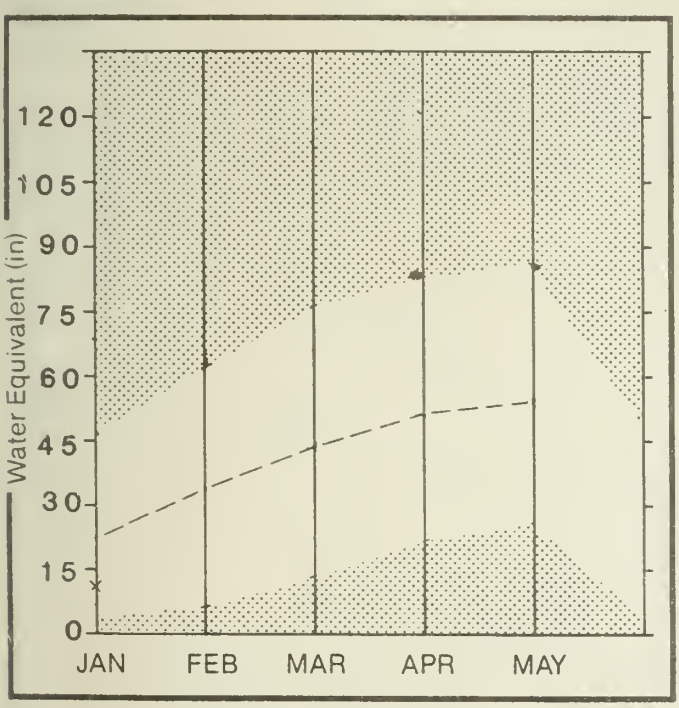
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
White River	2	75	70
Green River	2	33	71

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

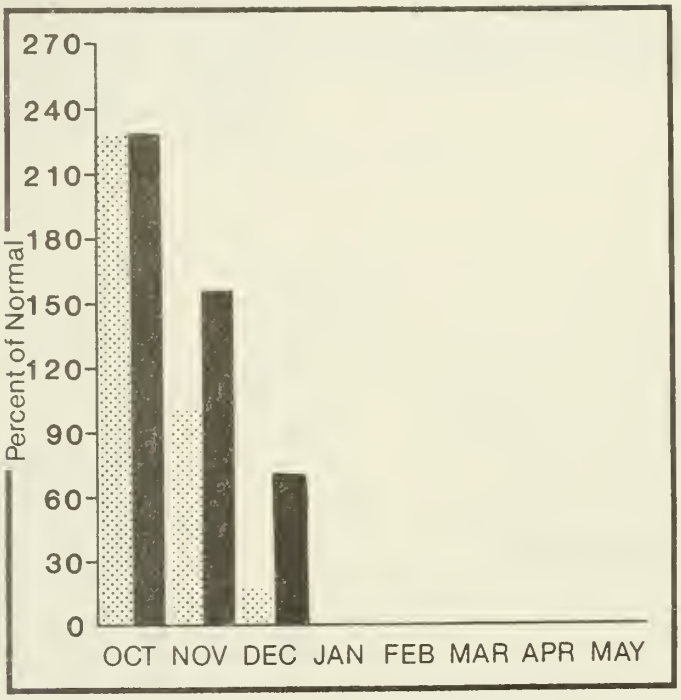
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover in the North Puget Basins is below the 1961-1980 average, with Baker River at 52% and Skagit River at 78%. December temperatures averaged five degrees below average for December. Precipitation for December was 14% of normal bringing the water year total to 96% of average. Reservoir storage is below normal at 25%. Streamflows in the Skykomish River were at 25% of normal for December. Forecasted streamflow for area rivers is for near normal runoff for spring and summer with the Skagit at 85%.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	2000.0	84.0	110.9	58.9				
	APR-JUL	1972.0	1670.0	84.0	110.7	58.7				
	APR-JUN	1485.0	1260.0	84.0	110.8	58.9				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROSS	1404.1	1096.0	1083.7	---
DIABLO RESERVOIR	90.6	84.8	83.5	---
GORGE RESERVOIR	9.8	7.6	7.9	---

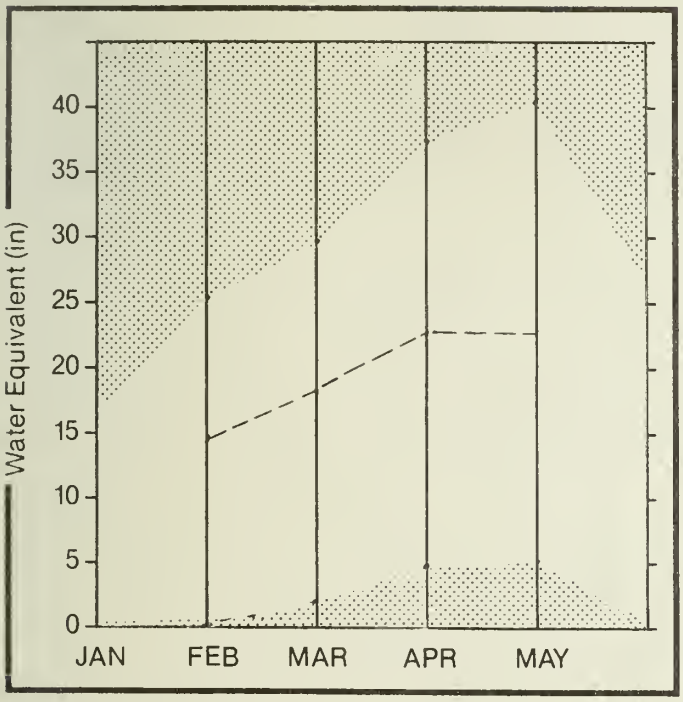
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Skagit River	3	55	8
Baker River	8	32	52
Cedar River	0	0	0
Snoqualmie River	0	0	0
Skykomish River	2	43	70

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OLYMPIC

Mountain snowpack* (inches)



*Based on selected stations

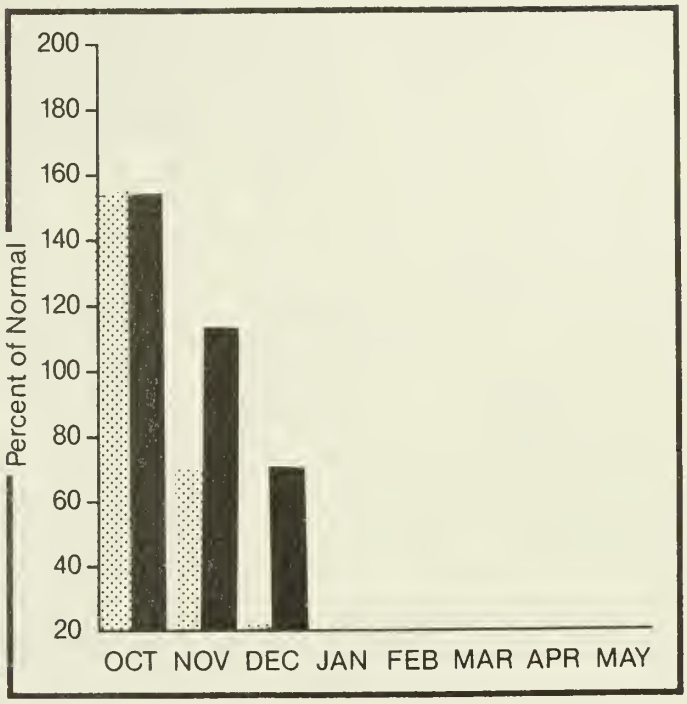
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation for December has been below average at 19% for the Olympic Basins. Water year precipitation is at 70% of normal. Snow cover is estimated to be near 90% with only Carrol Pass snow pillow for data. December temperatures were three degrees below normal. Area streamflows were below normal for December due to the cold dry weather. Streamflows for the coming months are expected to be below normal with flows of 75%.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	APR-SEP	160.0	120.0	75.0	75.0	75.0				
	APR-JUL	130.0	98.0	75.0	75.4	75.4				
	APR-JUN	97.0	73.0	75.0	75.3	75.3				
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	415.0	75.0	75.0	75.0				
	APR-JUL	454.0	340.0	74.0	74.9	74.9				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Dungeness River	0	0	0
Morse Creek	0	0	0
Elwha River	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
- Corps of Engineers

U.S. Department of Agriculture
- Forest Service

U.S. Department of Commerce
- NOAA, National Weather Service

U.S. Department of the Interior
- Bonneville Power Administration
- Bureau of Reclamation
- Geological Survey
- National Park Service

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-2000 LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712

51.573
n36 ww2

United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington

Washington Water Supply Outlook

February 1, 1986

The Library of the
MAR 06 1986
University of Illinois
at Urbana-Champaign

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

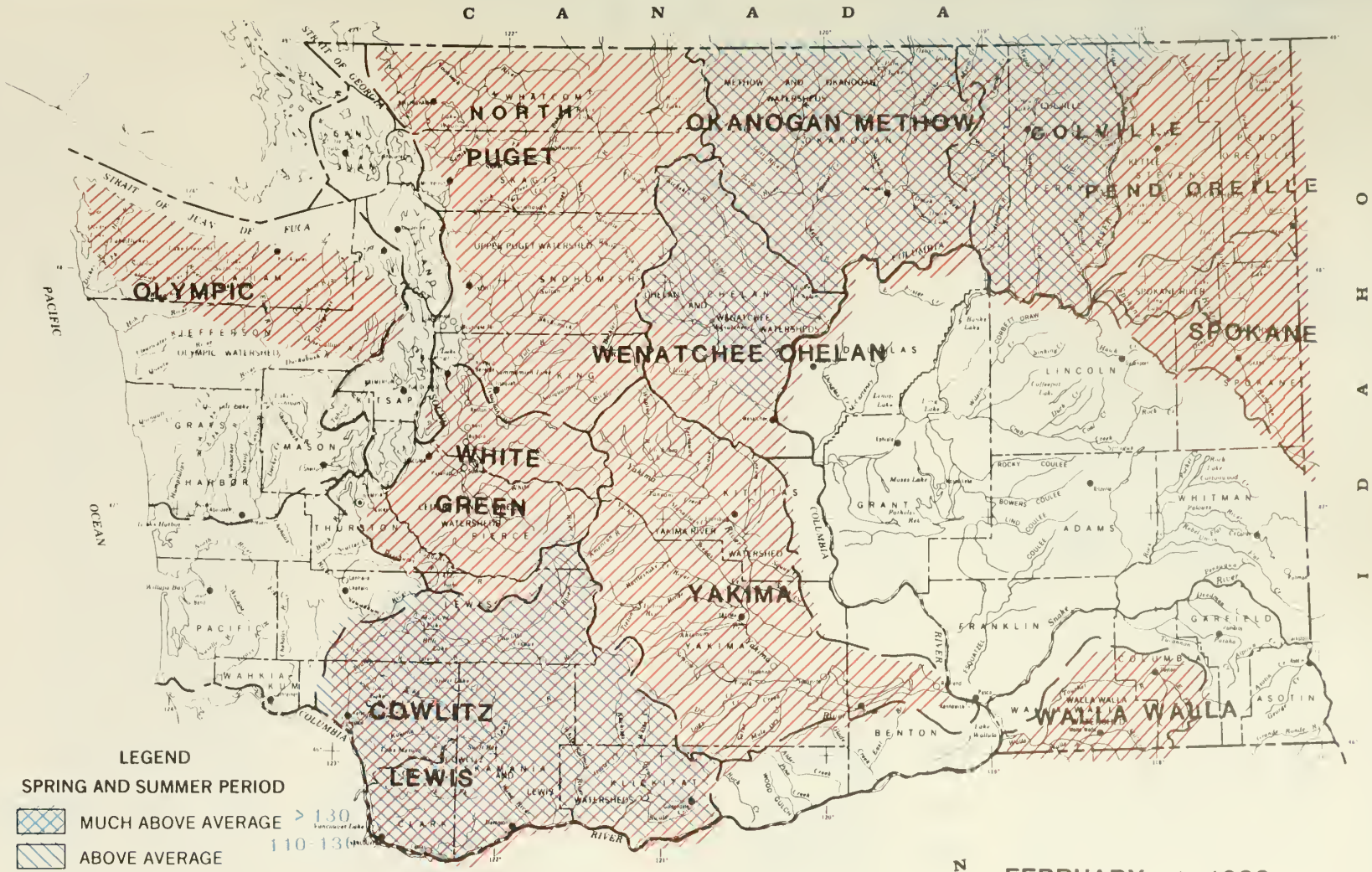
Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

U S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



LEGEND

SPRING AND SUMMER PERIOD

- MUCH ABOVE AVERAGE > 130
- ABOVE AVERAGE 110-130
- NEAR AVERAGE 90-110
- BELOW AVERAGE 70-90
- MUCH BELOW AVERAGE > 70
- NOT FORECAST
- WATERSHED BOUNDARY

FEBRUARY 1, 1986

STREAMFLOW PROSPECTS WASHINGTON

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Data compiled by SCS Field Personnel.

JANUARY 1986 4 R 39641

BASE 4 R 39260

INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

UPPER COLUMBIA DRAINAGE

NAME	NUMBER	SEC.	TWP	RANGE	ELEV
Pend Oreille River					
Bayer Mountain	17A2	7	31N	43E	5250
Bunchgrass Meadow	17A1SP	24	37N	44E	5000
Kettle River					
Summit G. S.	18A7	20	39N	35E	4600
Butte Creek	18A3	28	39N	35E	4070
Goat Creek	18A4	26	39N	35E	3595
Spokane River					
Ragged Ridge	17B02	12	27N	45E	3333
Colville River					
Baird	17A6	19	36N	42E	3215
Stranger Mountain	17A5	26	31N	38E	4990
Chewelah	17A4	11	32N	41E	4925
Okanagan River					
Muttan Creek No. 1	19A1	30	37N	24E	5700
Muttan Creek No. 2	19A4	19	37N	24E	6000
Salman Meadows	19A2SP	33	37N	24E	4500
Methow River					
Harts Pass	20A5SP	7	37N	18E	6500
Chelan Lake Basin					
Lyman Lake	20A23SP	18	31N	16E	5900
Park Creek Ridge	20A12SP	18	34N	16E	4600
Rainy Pass	20A9SP	21	35N	17E	4780
Mirrar Lake	20A39	30	31N	18E	5600
Entiat River					
Brief	20B19	34	28N	19E	1600
Entiat Meadows	20A33a	28	31N	17E	4540
Entiat River Trail	20A34a	2	29N	17E	3325
Fox Comp	20A36a	17	30N	18E	6510
Pope Ridge	20B20	22	29N	18E	3540
Pape Ridge Snow Pillow	20B24SP	22	29N	18E	3540
Pugh Ridge	20A32a	34	30N	18E	6725
Shady Pass	20A37	20	29N	19E	6200
Snow Brushy	20A35a	21	30N	17E	3910
Tommy Creek	20B21a	10	28N	18E	4900
Wenatchee River					
Berne-Mill Creek (New)	21B41SP	13	26N	14E	3240
Blewett Pass No. 2	20B2SP	35	22N	17E	4270
Stevens Pass	21B1SP	14	26N	13E	4070
Trough #2	20B25SP	10	20N	20E	5310
Squilchuck Creek					
Beehive Springs	20B3	12	21N	19E	4400
Stemilt Creek					
Stemilt Slide	20B6	30	21N	20E	5000
Upper Wheeler	20B7SP	30	21N	20E	4400
Yakima River					
Ahtanum R. S.	21C11	24	12N	14E	3100
Big Boulder Creek	21B9SP	35	23N	14E	3200
Bumping Lake	21C8P	23	16N	12E	3450
Bumping Lake New	21C36	13	16N	12E	3400
Bumping Ridge	21C38SP	9	15N	12E	4600
Fish Lake	21B4SP	28	24N	14E	3371
Green Lake	21C10SP	3	12N	13E	6000
Grouse Camp	20B11SP	29	21N	19E	5385
Lake Cle Elum	21B14M	15	20N	14E	2200
Morse Lake	21C17SP	6	16N	11E	5400
Tunnel Avenue	21B8P	13	21N	11E	2450
White Pass (East Side)	21C28SP	2	13N	11E	4500

LOWER COLUMBIA DRAINAGE

NAME	NUMBER	SEC	TWP.	RANGE	ELEV
Asatin Creek					
Spruce Springs	17C4	9	8N	40E	5700
Touchet River					
Touchet No. 2	17C5SP	6	7N	40E	5530
Lewis River					
June Lake	22C09SP	26	8N	5E	3200
Lane Pine Shelter	21C26SP	8	9N	7E	3800
Plains of Abraham	22C1SP	35	9N	5E	4400
Spencer Meadow	21C20SP	16	8N	7E	3400
Surprise Lakes	21C13SP	14	7N	8E	4250
Cowlitz River					
Cayuse Pass	21C6	15	16N	10E	5300
Pigtail Peak	21C33SP	11	13N	11E	5900
Patata Hill	21C14SP	36	10N	10E	4500
Sheep Canyon	22C10SP	12	8N	4E	4050
Strawberry	22C08SP	9	10N	6E	3280

PUGET SOUND DRAINAGE

NAME	NUMBER	SEC	TWP.	RANGE	ELEV
Nisqually River					
Paradise Park (New)	21C35SP	13	15N	8E	5500
White River					
Corral Pass	21B13SP	30	18N	11E	6000
Green River					
Airstrip	21B24P	18	20N	11E	1800
Charley Creek	21B25	27	21N	8E	1200
Cougar Mountain	21B42SP	21	21N	9E	3200
Gross Mountain No. 2	21B27	14	20N	8E	2900
Gross Mountain No. 3	21B28	12	20N	8E	2100
Lester Creek	21B29	36	20N	10E	3100
Lynn Lake	21B50	22	20N	8E	4000
Sawmill Ridge	21B31	5	19N	11E	4700
Stampede Pass	21B10SP	25	21N	11E	3860
Twin Camp	21B30	18	19N	11E	4100
Cedar River					
City Cabin	21B3	10	21N	10E	2390
Mt. Gardner	21B21P	30	22N	10E	3300
Snoqualmie River					
Alpine Meadow	21B48	31	27N	9E	3500
Olallie Meadows	21B2P	19	22N	11E	3625
Olallie Meadows East	21B55SP	20	22N	11E	3700
Skagit River					
Beaver Creek Trail	21A4	35	39N	12E	2200
Beaver Pass	21A1	9	39N	12E	3680
Brawn Tap	21A28a	26	40N	12E	6000
Devils Park	20A4	34	38N	16E	5900
Freezeout Creek Trail	20A1	14	40N	14E	3500
Freezeout Meadows (New)	20A38	8	40N	16E	5000
Granite Creek	20A06	25	36N	16E	3500
Meadows Cabins	20A8	29	36N	14E	1900
New Hazomeen Lake	21A30	19	40N	14E	2800
Thunder Basin	20A07	10	35N	14E	4200
Baker River					
Dock Butte	21A11A	8	36N	8E	3800
Easy Pass	21A7A	19	39N	11E	5200
Jasper Pass	21A6A	17	38N	11E	5400
Marten Lake	21A9A	23	38N	8E	3600
Mount Blum	21A18a	27	38N	10E	5800
Racky Creek	21A12AP	20	37N	8E	2100
Schreibers Meadow	21A10AP	18	37N	8E	3400
S. F. Thunder Creek	21A14A	20	36N	9E	2200
Sulphur Creek	21A13	22	37N	8E	1600
Three Mile Creek	21A15	18	36N	9E	1600
Watson Lakes	21A8P	25	37N	9E	4500

OLYMPIC PENINSULA

NAME	NUMBER	SEC.	TWP	RANGE	ELEV
Dungeness River					
Deer Park	23B4	1	28N	5W	5200
Elwha River					
Hurricane	23B3	36	29N	7W	4500
Cox Valley	23B14	31	29N	6W	4500

LEGEND

21A7	Snow Course Only
21A7a	Aerial Marker Only
21A7A	Snow Course And Aerial Marker
21A7M	Snow Course And Soil Moisture Station
21A7m	Soil Moisture Station
21A7P	Snow Course And Precipitation Storage Gage
21A7p	Precipitation Storage Gage
21A7SP	Snow Pillow

GENERAL OUTLOOK

SUMMARY:

The Feburary 1 snowpack is below average for the west slope of the Cascade Mountains of Washington and the extreme eastern portion of the state. Snowcover is near or above average for the east slopes of the Cascade mountains. Streamflows continued to be below average for January, while precipitation was above average. Forcasted streamflows variy from near average to below average. In the below average are Olympics 74%, Green 76%, Spokane 75% and the Pend Oreille at 85%.

SNOWPACK:

Snowpack in Washington varied greatly with 60% of normal in the Elwah and Green River basins to 138% of average in the Squilchuck Basin above Wenatchee. Snow surveys taken in other areas of the state show the following snow cover; Spokane and Pend Oreille 71%, Cowlitz 82%, and the Skagit 90%, Okanogan 112%, Wenatchee 86%, Yakima 90%, Walla Walla 81%, Cowlitz 82% and the Skagit 90%.

PRECIPITATION:

Precipitation was above normal over most of Washington during January. Extremely heavy rainfall occurred January 18 with some stations reporting new record maximum 24 hour precipitation rates. The northwest slopes of the Cascades were 100% of average while the south west slope were at 97%. The eastern slopes of the Cascades were 107% of average and the northeast area of Washington was 141% of normal for January.

RESERVOIRS:

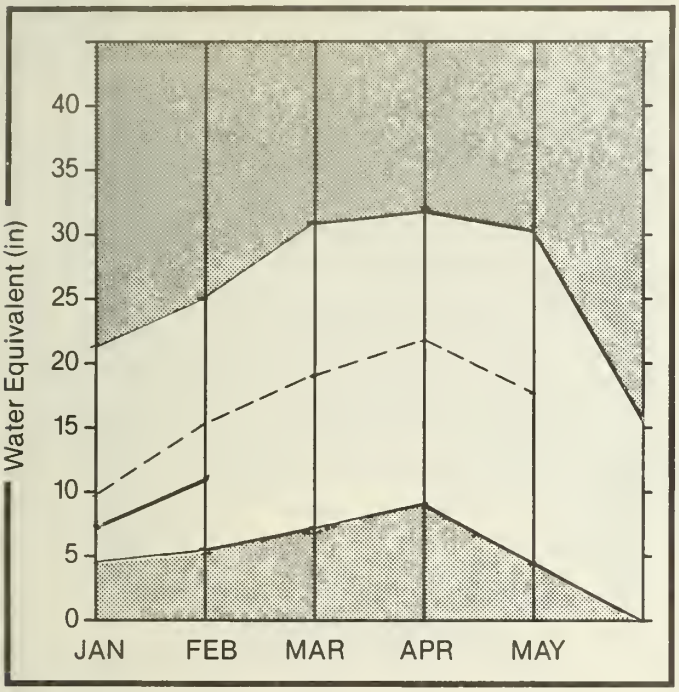
Reservoir storage continued below normal for January. Storage in the Yakima Basin as reported by the Bureau of Reclamation was 441,000 acre feet or 61% of the normal February 1 storage. Irrigation reservoirs in the Okanogan area were at 76% of normal storage. Power storage reservoirs at Chelan are at 60% and Coeur d' Alene is at 25% of normal. Reservoir storage is still showing the effects of a cold, dry December and January.

STREAMFLOW:

January streamflow was below normal. The western side of the state had 80% of normal runoff on the Cowlitz River, 99% on the Chehalis, and 93% on the Skykomish River. The eastern slope of the Cascades had 81% of normal runoff from Lake Chelan, 69% from the Wenatchee River, and 40% from the Yakima River. Flows from the Columbia River at the international boundary were 90% of the January normal and 82% at The Dalles. The Spokane River was 49% of normal and the Pend Oreille River was at 84%.

SPOKANE

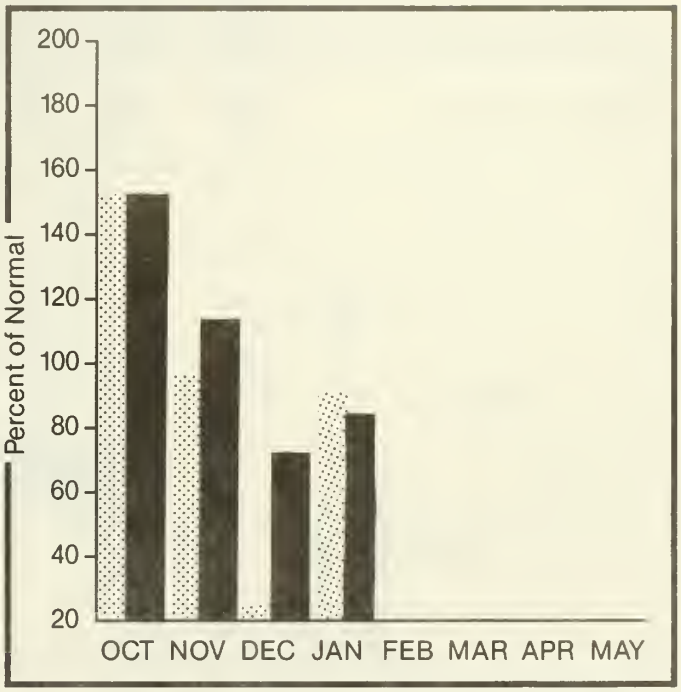
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

The forecasted streamflows show no improvement for February 1, with 75% of average for the Spokane River. Precipitation was 91% of the January normal, reducing the water year total to 82% of average. Streamflow for the Spokane River is reported to be 49% of normal for January. Spokane temperatures were 4 degrees above normal for January. Storage in Coeur d' Alene Lake is 25% of average. Snowpack for the Basin was 69% of normal for February first.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

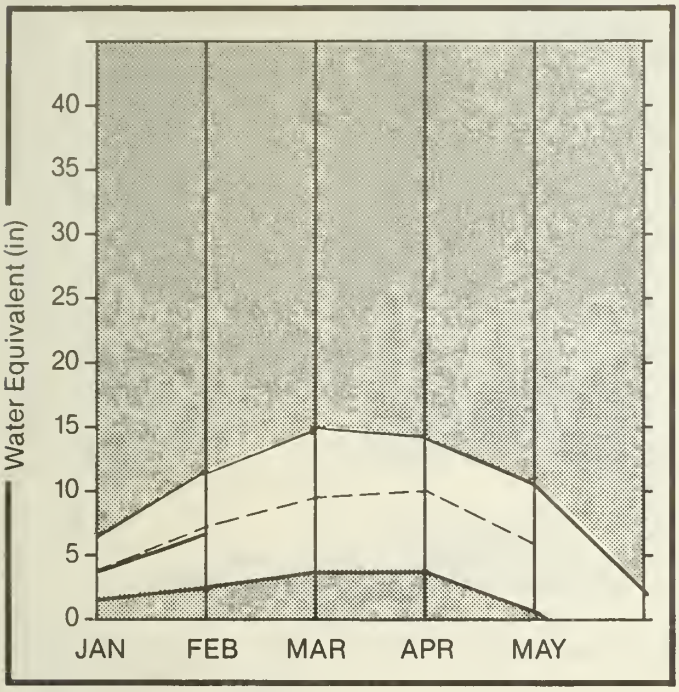
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	APR-SEP	2848.0	2160.0	75	112	40				
	APR-JUL	2754.0	2090.0	75	112	40				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
COEUR D'ALENE	225.1	59.2	31.3	142.4	Spokane River	12	60	69

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

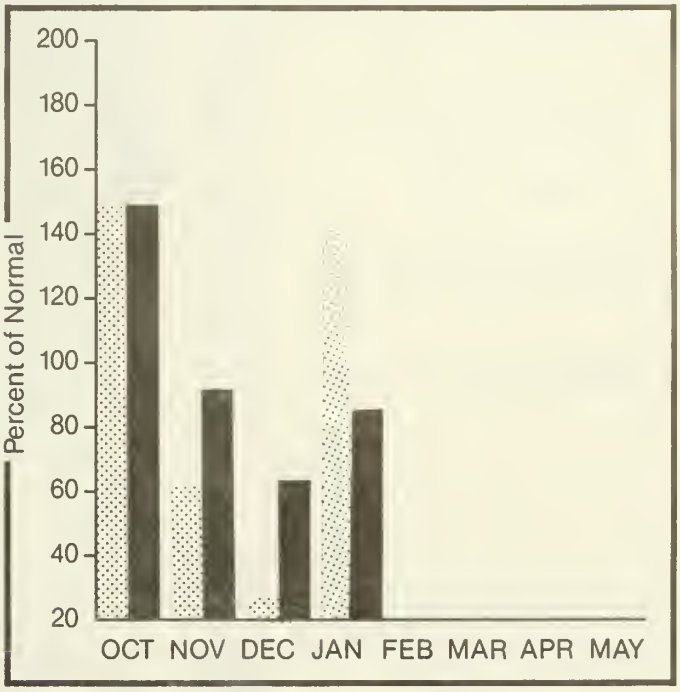
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum — Minimum — Average — Current — Monthly precipitation — Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasted stream flows vary over the basin, with 78% predicted for the Pend Oreille River, 100% on the Kettle River and 85% on the Colville River. Temperatures were 5 degrees above average for January while precipitation was 145% of the January normal. The above average precipitation raised the water year total to 84% of normal. January streamflows were 84% of average on the Pend Oreille , while the Kettle gage was iced in. Snowpack varied from 70% of normal on the Pend Oreille to 95% on the Kettle River.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	12000.0	77	100	56				
	APR-JUL	14156.0	11000.0	77	100	56				
	APR-JUN	12227.0	9540.0	78	100	56				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	114.0	85	135	35				
	APR-JUL	123.0	104.0	84	135	35				
	APR-JUN	114.0	96.0	84	134	34				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1830.0	100	139	61				
	APR-JUL	1738.0	1740.0	100	139	61				
	APR-JUN	1581.0	1580.0	99	139	61				
COLUMBIA RIVER at Birchbank *	APR-SEP	44605.0	42600.0	95	116	76				
	APR-JUL	35705.0	34100.0	95	116	76				
	APR-JUN	26027.0	24700.0	94	115	75				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	60600.0	90	108	74				
	APR-JUL	56169.0	50900.0	90	108	74				
	APR-JUN	44036.0	40100.0	91	108	74				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROOSEVELT	5232.0	5014.1	4224.7	3749.0
BANKS	715.0	391.0	774.8	599.0

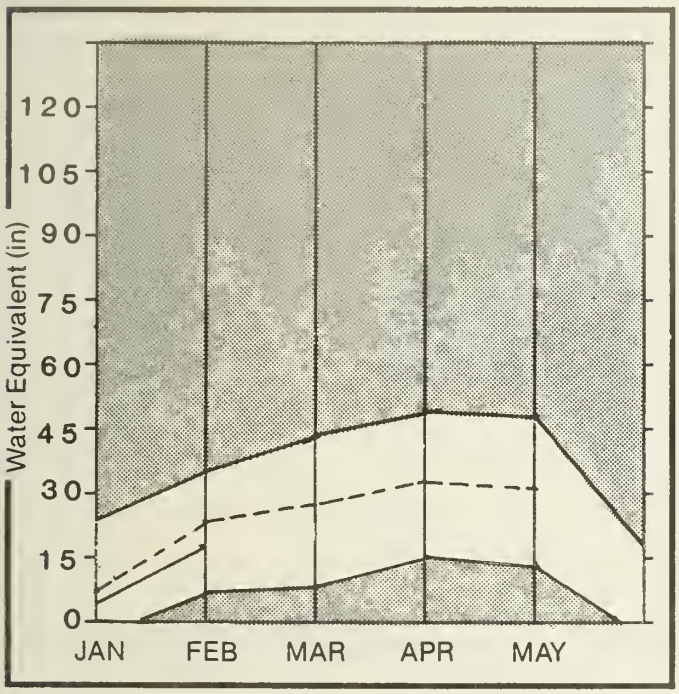
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	0	0	0
Pend Oreille River	9	63	70
Kettle River	6	93	91
Omac Lake, Twin Lakes	0	0	0
Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

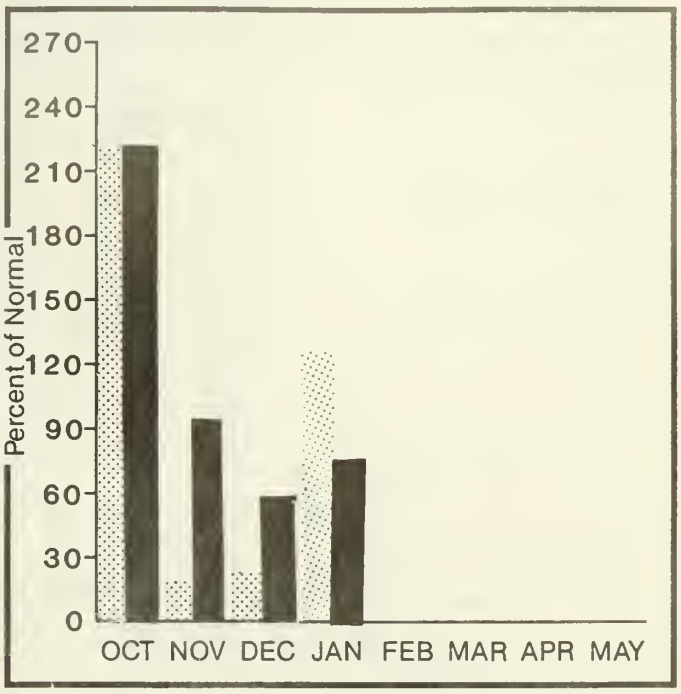
OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum — Minimum — Average — Current

Monthly precipitation — Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack on the Okanogan Basin showed improvement in the Canadian portion of the watershed with 112% of February 1 average. The U.S. snow courses were 76% of average. The snow covering the Methow is at 84 % of normal. Forcasted streamflows are 93% on the Okanogan and 94% on the Methow River. January precipitation was 123% of normal raising the water year total to 75% of average. Stream gages were iced in on the Okanogan River. Temperatures averaged 6 degrees above normal. Reservoir storage was 76% of

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1370.0	93	146	42				
	APR-JUL	1365.0	1280.0	93	146	42				
	APR-JUN	1161.0	1090.0	93	146	42				
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1540.0	93	148	40				
	APR-JUL	1497.0	1400.0	93	147	40				
	APR-JUN	1262.0	1180.0	93	147	40				
METHOW RIVER nr Pateros	APR-SEP	980.0	930.0	94	126	64				
	APR-JUL	908.0	860.0	94	126	64				
	APR-JUN	773.0	734.0	94	126	64				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

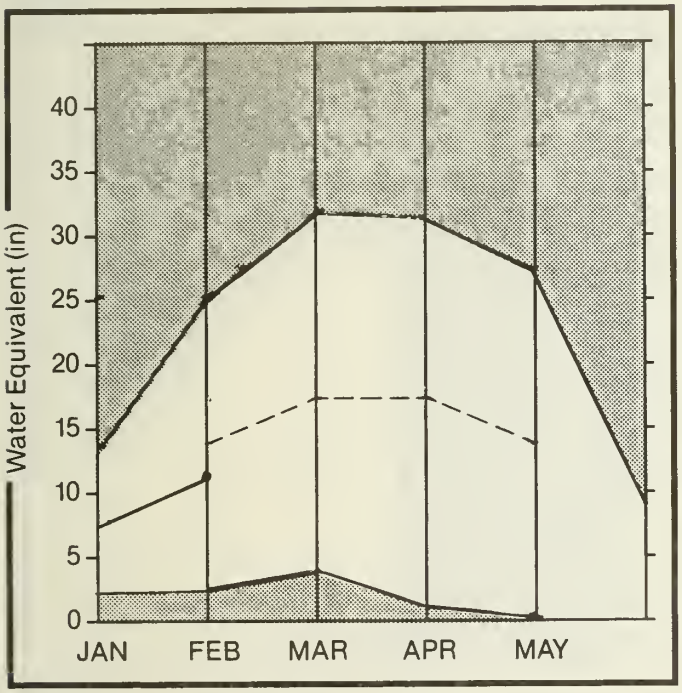
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Okanogan River	22	90	87
Methow River	2	81	84

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

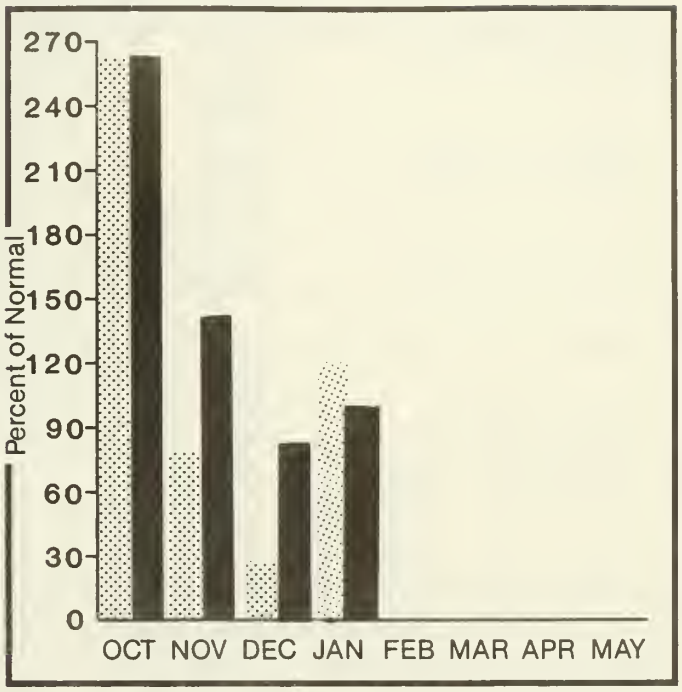
WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum — Minimum — Average — Current

Monthly precipitation — Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

The percent snow cover increased over the basin improving from the January 1st readings on the Chelan from 75% to 107%, and on the Wenatchee from 74% to 86%. Forecasted streamflow for the April-September period are for 94% on the Chelan, 94% on the Wenatchee, 93% on the Entiat and 94% on the Stimelt. Precipitation was 120% of average for January bringing the water year total to 96% of normal. Streamflows were 81% on the Chelan and 69% on the Wenatchee River. Storage in the Chelan was 60%.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1142.0	94	120	70				
	APR-JUL	1055.0	1000.0	94	120	70				
	APR-JUN	826.0	780.0	94	119	69				
STEHEKIN R. at Stehekin	APR-SEP	860.0	840.0	97	118	78				
	APR-JUL	727.0	710.0	97	118	78				
	APR-JUN	553.0	540.0	97	118	78				
ENTIAT RIVER nr Ardenvoir	APR-SEP	234.6	220.0	93						
	APR-JUL	213.0	200.0	93						
	APR-JUN	172.0	160.0	93						
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1200.0	94	120	70				
	APR-JUL	1113.0	1050.0	94	128	60				
	APR-JUN	899.0	850.0	94	129	61				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	131.0	94						
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	330.0	89						
	APR-JUL	340.0	300.0	88						
	APR-JUN	270.0	240.0	88						
COLUMBIA R. bl Rock Island Dam *	APR-SEP	72781.0	67000.0	92	110	74				
	APR-JUL	61601.0	56700.0	92	110	74				
	APR-JUN	48384.0	44500.0	92	110	74				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CHELAN LAKE	676.1	267.5	226.9	450.6

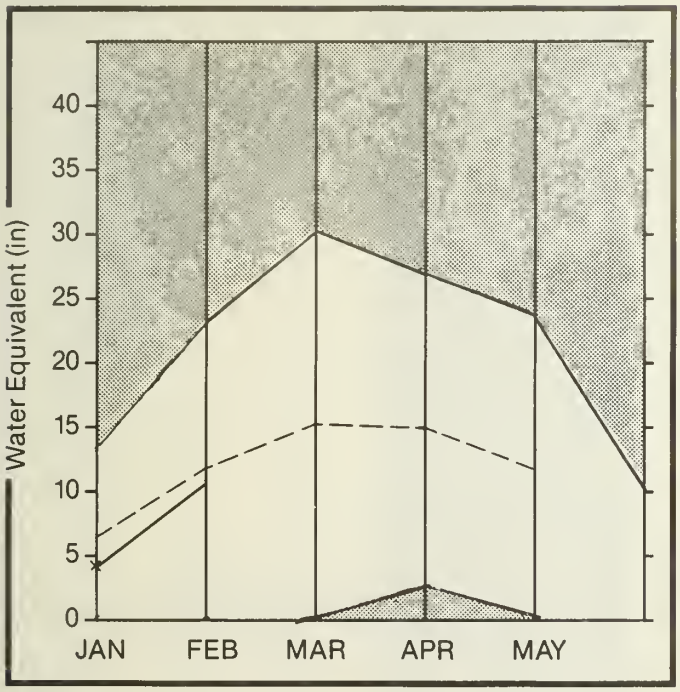
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	3	108	107
Entiat River	2	140	102
Wenatchee River	7	83	86
Colockum Creek	1	109	118
Squilchuck Creek	1	191	138
Stemilt Creek	1	135	105

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

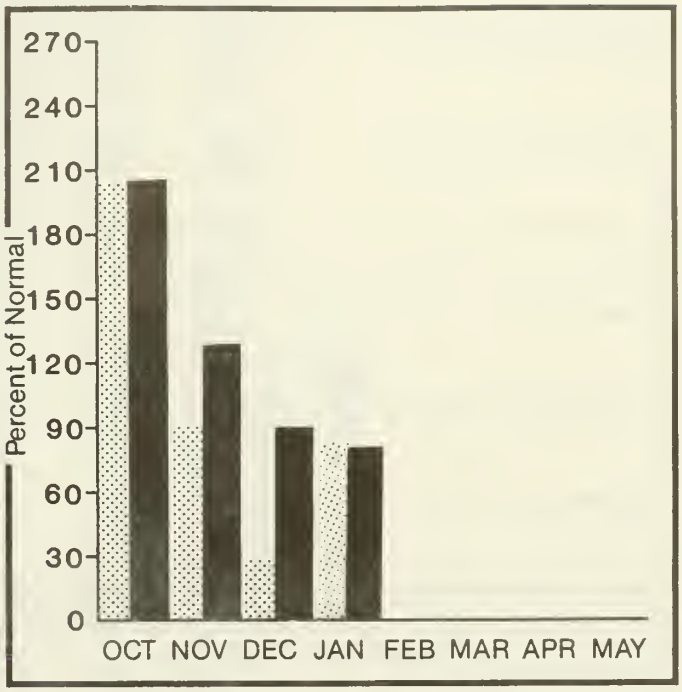
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Snow cover improved in the Yakima Basin to 90% of average. Streamflow forecasted for the basin include 89% for the Yakima River at Martin, 90% on the Naches, 90% on the Tieton and 88% on the Ahtanum. Reservoir storage showed minor improvement, but remained at 61% of normal with 441,000 acre feet impounded. January precipitation was 86% of normal with temperatures 2 degrees above average. Streamflow was 40% of normal on the Yakima River.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	125.0	89	106	74				
	APR-JUL	128.0	115.0	89	105	74				
	APR-JUN	111.0	100.0	90	106	74				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	785.0	83	96	70				
	APR-JUL	854.0	711.0	83	96	70				
	APR-JUN	734.0	609.0	82	96	70				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1760.0	83	106	62				
	APR-JUL	1898.0	1590.0	83	106	62				
	APR-JUN	1667.0	1400.0	83	106	62				
KACHESS RIVER nr Easton *	APR-SEP	121.0	110.0	90	105	77				
	APR-JUL	115.0	100.0	86	101	73				
	APR-JUN	101.0	90.0	89	103	75				
CLE ELUM RIVER nr Roslyn *	APR-SEP	463.0	420.0	90	103	79				
	APR-JUL	422.0	380.0	90	102	78				
	APR-JUN	353.0	320.0	90	103	79				
BUMPING RIVER nr Nile *	APR-SEP	142.0	126.0	88	115	63				
	APR-JUL	129.0	114.0	88	115	62				
	APR-JUN	107.0	95.0	88	113	63				
AMERICAN RIVER nr Nile	APR-SEP	124.0	110.0	88	114	64				
	APR-JUL	113.0	100.0	88	113	64				
	APR-JUN	94.0	85.0	90	116	66				
TIETON RIVER at Tieton *	APR-SEP	246.0	221.0	89	115	65				
	APR-JUL	207.0	190.0	91	117	67				
	APR-JUN	165.0	150.0	90	111	89				
NACHES RIVER nr Naches *	APR-SEP	867.0	751.0	86	115	59				
	APR-JUL	784.0	679.0	86	115	59				
	APR-JUN	667.0	580.0	86	115	59				
AHTANUM CREEK nr Tampico *	APR-SEP	47.0	41.0	87	128	47				
	APR-JUL	43.0	38.0	88	128	49				
	APR-JUN	37.0	33.0	89	130	49				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
KEECHELUS	157.8	62.4	83.3	96.0
KACHESS	239.0	107.0	149.0	170.0
CLE ELEM	436.9	129.4	175.8	251.0
BUMPING LAKE	33.7	8.2	3.8	9.0
RIMROCK	198.0	129.5	92.1	115.0

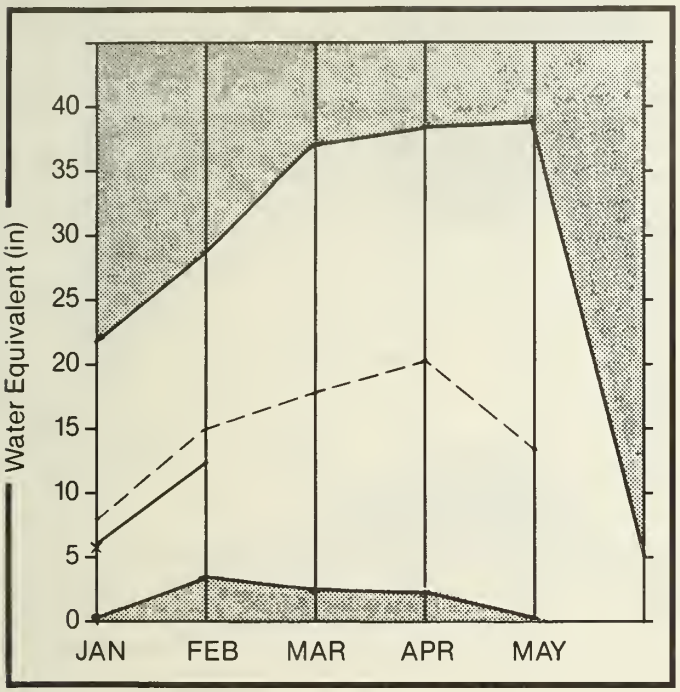
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	15	110	90
Ahtanum Creek	2	130	81

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

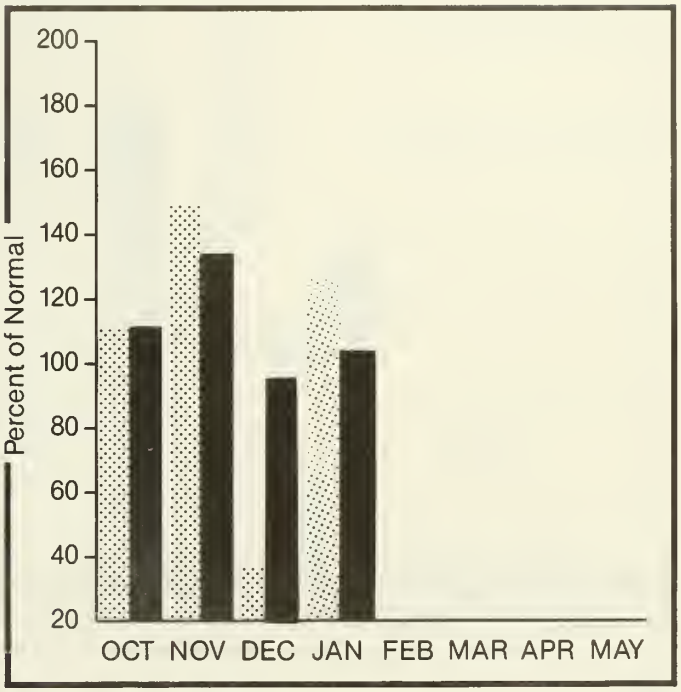
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflows are expected to be 88% of normal in the Walla Walla River during the spring and summer. January streamflow was at 65% of average. Snow cover is 81% if normal for the February 1 readings. Temperatures in the basins were 7 degrees above normal during January.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK at Walla Walla	APR-SEP	17.5	15.1	86	120	51				
	APR-JUL	17.3	14.8	85	121	52				
	APR-JUN	17.1	14.7	85	122	52				
COLUMBIA R. at The Dalles *	APR-SEP	101000.0	88400.0	88	108	68				
	APR-JUL	86500.0	75700.0	88	108	68				
	APR-JUN	70100.0	61700.0	88	108	68				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

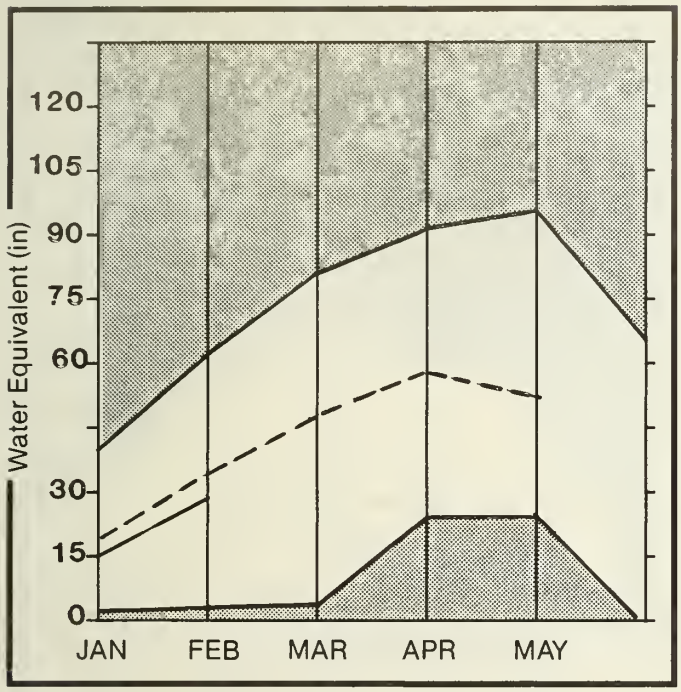
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Mill Creek	1	44	81

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

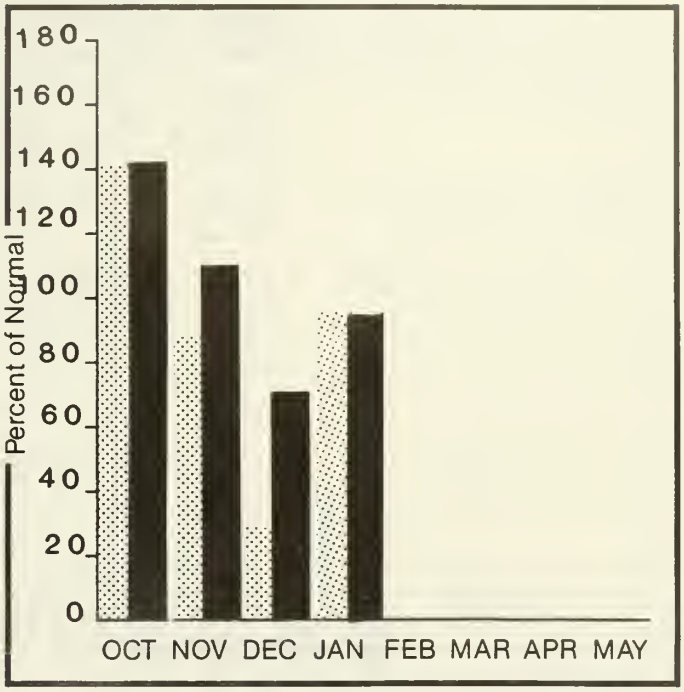
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflow was 80% of January average on the Cowlitz River. Forecasted streamflow are 89% on the Cowlitz and 90% on the Lewis River for the April-September period. Precipitation remained below average in this basin with January having 94% of normal. Temperatures were 4 degrees above average for January. Snow cover in the Cowlitz River Basin was 82% of average and 94% on the Lewis River.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1120.0	89	127	53				
	APR-JUL	1086.0	980.0	90	127	53				
	APR-JUN	961.0	860.0	89	127	52				
COWLITZ R. bl Mayfield Dam *	APR-SEP	2038.0	1830.0	89	131	49				
	APR-JUL	1778.0	1600.0	89	131	49				
	APR-JUN	1502.0	1350.0	89	131	49				
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2430.0	90	124	58				
	APR-JUL	2323.0	2110.0	90	124	58				
	APR-JUN	1980.0	1800.0	90	124	58				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

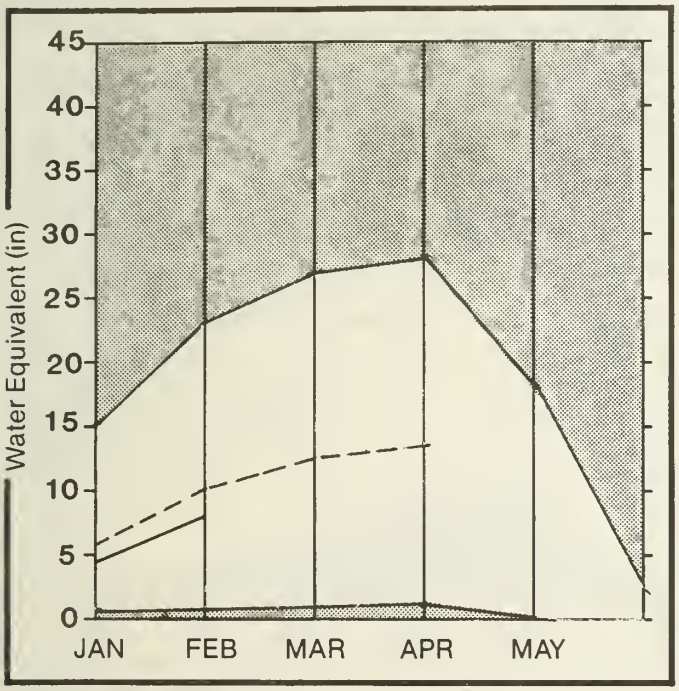
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Cowlitz River	1	85	82
Lewis River	4	83	94

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

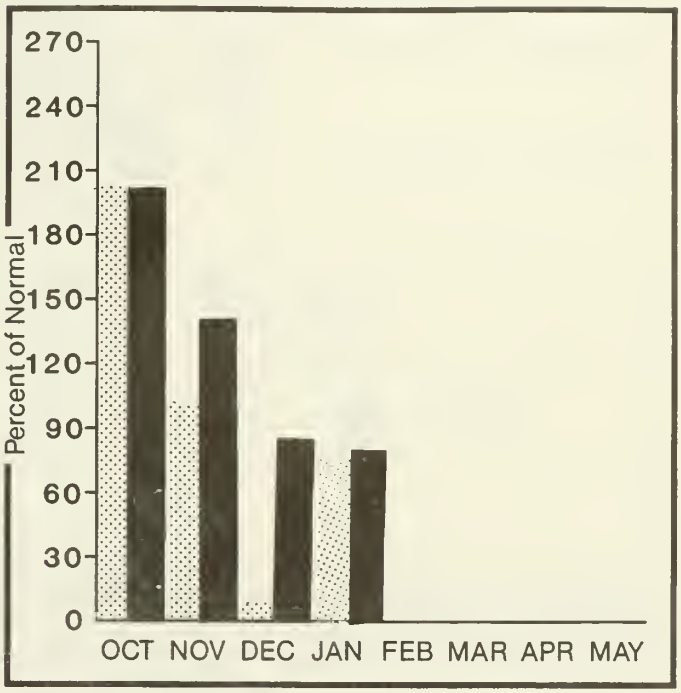
WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum — Minimum — Average — Current — Monthly precipitation — Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover on the Green River Basin was at 61% of normal for the February 1st snow survey. Streamflows are forecasted to be 76% of normal for the April-September period. Temperatures averaged 6 degrees above normal for January. Streamflows were near average for January with precipitation at 71% of normal. The water year precipitation is at 81% of average. Heavy rain on January 18 established new 24 hour precipitation records at some recording stations, and caused some local flooding.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	246.0	77						
	APR-JUL	284.0	218.0	76						
	APR-JUN	256.0	190.0	74						
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	84.0	90						

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

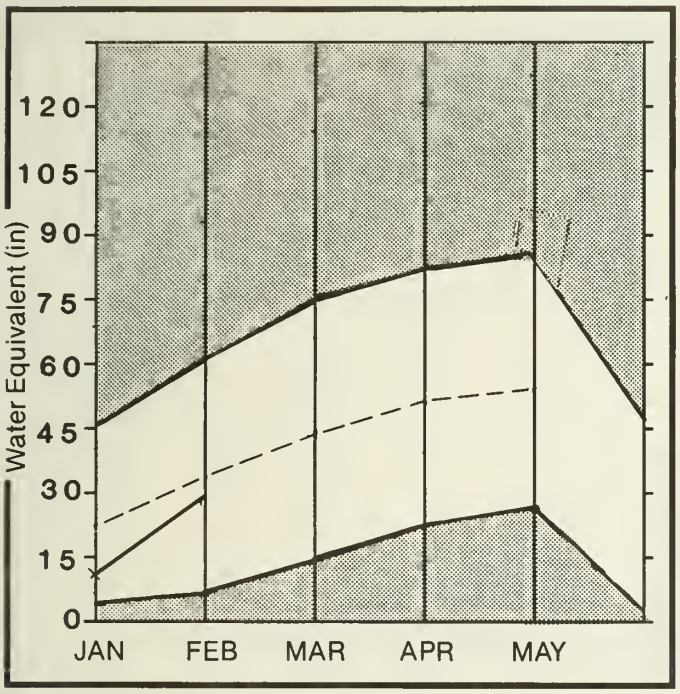
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
White River	2	111	84
Green River	9	50	61

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

NORTH PUGET SOUND

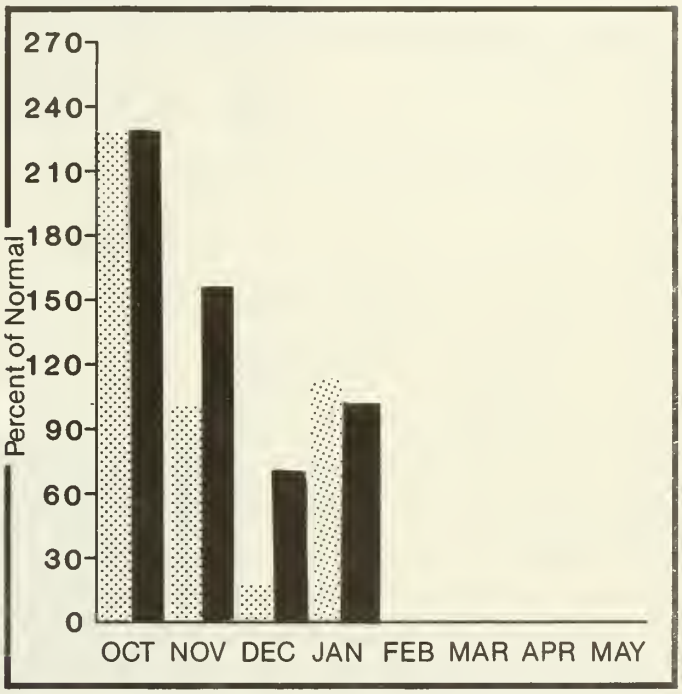
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover improved in the Skagit Basin going from 78% for January 1st to 91% for Feburary 1. Streamflows are forecasted to be 87% of normal for the April-September period. Precipitation was 111% of normal for January bringing the water year total to 100%. Temperatures were 6 degrees above average for January. Some areas of local floodig occurred during the January 18 rain storm.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	2070.0	87	110	66				
	APR-JUL	1972.0	1740.0	88	110	66				
	APR-JUN	1485.0	1300.0	87	110	66				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROSS	1404.1	955.9	880.5	1033.9
DIABLO RESERVOIR	90.6	85.0	84.2	84.2
GORGE RESERVOIR	9.8	7.9	8.1	7.9

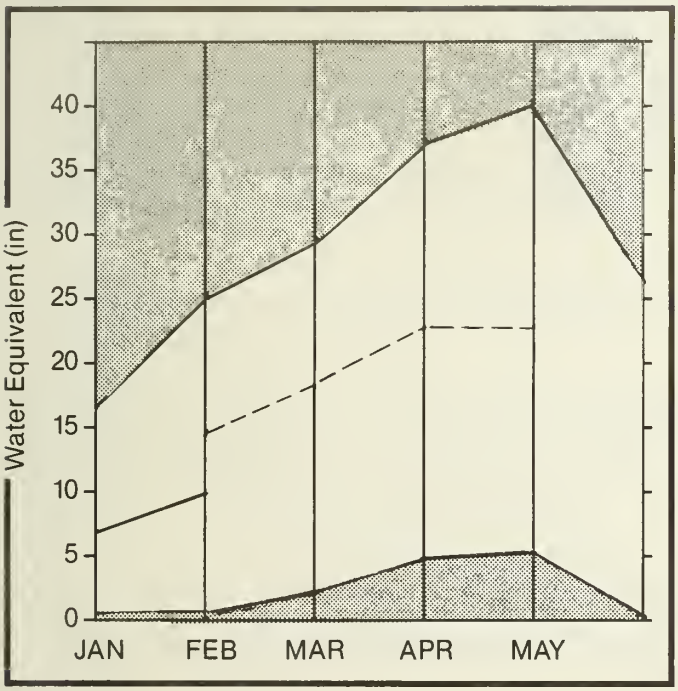
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Skagit River	13	105	90
Baker River	0	0	0
Cedar River	0	0	0
Snoqualmie River	7	0	0
Skykomish River	2	71	72

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OLYMPIC

Mountain snowpack* (inches)



*Based on selected stations

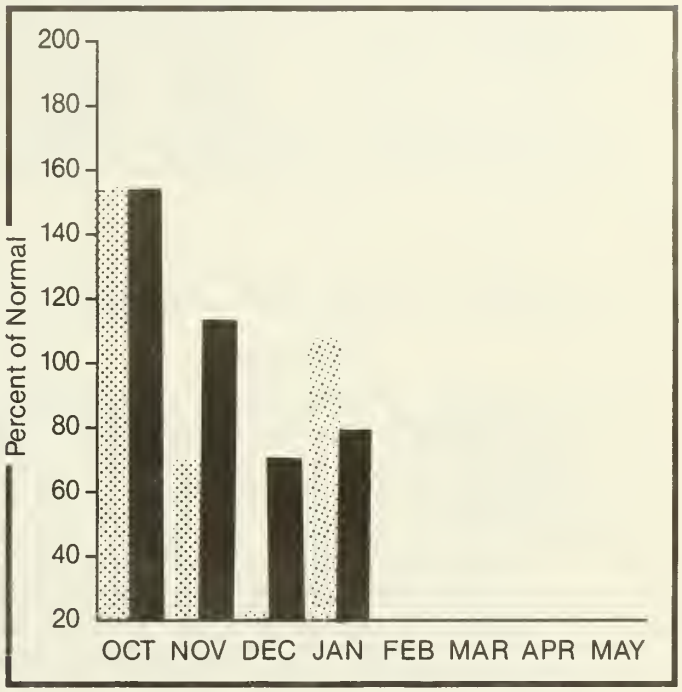
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover in the Olympic Basin remained much the same as the January report, with the Dungeness 75% and the Elwah 60% of normal. Forecasted streamflows are 78% on the Dungeness and 74% on the Elwah for the April-September period. Some local flooding occurred during the rainfall of January 18. Precipitation for January was 105% of normal, bringing the water year total to 79% of average. Temperatures for January were 6 degrees above normal.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	APR-SEP	160.0	125.0	79						
	APR-JUL	130.0	100.0	76						
	APR-JUN	97.0	76.0	78						
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	410.0	74						
	APR-JUL	454.0	340.0	74						

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Dungeness River	1	71	75
Morse Creek	1	91	88
Elwha River	1	73	60

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

SNOW SURVEYS

Water is the lifeblood of the West--the crucial commodity. The region's development from a thousand years ago to today has been tied to the availability of water.

Water supply varies greatly from season to season and from year to year, an water is often located great distances from where it is needed. Snowmelt from winter accumulations in the high mountains is the source of about 70 percent of the region's water supply. Typically, irrigators and communities collect, store, and transport water to regulate quantity and ensure availability when and where it is required. With about 40 million acres under irrigation, modern agriculture together with the pressures of a rapidly expanding society make heavy demands on this water.

Since the development of new supplies has become extremely costly and not feasible in many cases, conservation of existing water resources is critical to the West.

Early westerners realized the ties between the size of the winter snowpack in the high mountain ranges--Rockies, Cascades, Sierra Nevada--and their summer water supply. Some attempts to measure the snow and predict runoff had been made in the East as early as 1834, but it wasn't until 1904 that a systematic survey was undertaken in the West. Dr. James Church, a classics professor at the University of Nevada in Reno, made surveys on Mt. Rose in the Sierra Nevada. He developed measuring equipment and sampling techniques that led to the first water supply forecasts. Success in Nevada soon spread to other states and agencies. By 1935, at last nine independent snow surveys were being conducted.

Drought is a part of life in the West. In 1934, a particularly severe drought resulted in farmers demanding better predictions of the streamflows available for growing crops. Others who counted on water for industry, power generation, and domestic use echoed this request. Congress responded in 1935 by passing legislation creating a federal snow survey and water supply forecasting program under the direction of the Bureau of Agricultural Engineering in the Department of Agriculture. In 1939, the bureau was transferred to the Soil Conservation Service (SCS); this agency continues to direct a cooperative federal, state, and private snow survey program. The National Weather Service is a major cooperator with SCS in making these water supply forecasts. Today, forecasts are routinely issued for over 600 locations in the West.

Manual surveys, similar to those initiated by Dr. Church and performed by teams of trained surveyors, have been the backbone of the measurement network. With the advent of mechanized oversnow machines and aircraft, the surveyor's task has been eased somewhat, but snowshoes and skies are still required to reach many remote sites. Periodic measurements at some 1400 snow courses provide the insight into snowpack accumulation patterns. Forecasters still use this information advantageously, but more frequent data are needed to improve the accuracy and timeliness of forecasts. Various methods of remote data acquisition have been tested, including conventional line-of-sight radio telemetry, satellite based telemetry, and a new technique called meteor burst telemetry.

Meter burst telemetry relies on the physical phenomenon that enables radio signals to be reflected off ionized meteorite trails 50-75 miles above the earth's surface. Utilizing this principle, sites as far apart as 1200 miles can communicate with one another for very short periods ranging from fractions of seconds up to several seconds. This interval is sufficiently long to "burst" relatively short data messages between sending and receiving stations. This method of communications is ideally suited for interrogating remote data sites on a schedule of several polls per day. The interference that mountains often cause in conventional communications is not a problem for a meteor burst system.

In 1977, SCS began modernizing its snow surveys by introducing meteor burst technology for acquiring snowpack data. The project, called SNOTEL (for SNOw TELemetry) measures and transmits snowpack, precipitation, and temperature on a daily basis throughout the West. A snow pillow serves as a hydraulic weighting platform to measure the snow water content.

About 550 SNOTEL sites are in operation. Most sites are powered by solar panels and are visited only a few times each year. Data are transmitted daily by meteror burst to a master station in Boise, Idaho, or Ogden, Utah, and then automatically forwarded by telephone to a central computer in Portland, Oregon.

Hydrologic data gathered from the SNOTEL system, snow course network, and other climatological stations are assembled in the computer system at the West National Technical Center in Portland, Oregon, for analysis and interpretation. A series of computer programs, know collectively as the Centralized Forecasting System (CFS), is the analytical tool used to generate streamflow forecasts, data summaries, and narratives that describe the current water supply outlook. This information is made immediately available to over 300 SCS field offices and other interested users through dial-up telecommunications.

Water suppliers are no longer a mystery thanks to this systematic snowpack inventory and monitoring program and advanced computer technology. Managers are alerted early in the water year to expect normal flows, water shortages, or floods, and they can make plans while there is still time to take effective action. Snow surveys and water supply forecasting do not create water, but they do the next best thing: They provide the tools for conservation of this most precious of the West's resources. For more information on this program, contact your local conservation district or SCS office.

All programs and services of the USDA
are available to everyone without regard
to race, creed, color, sex, age, handicap
or national origin.

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
- Corps of Engineers

U.S. Department of Agriculture
- Forest Service

U.S. Department of Commerce
- NOAA, National Weather Service

U.S. Department of the Interior
- Bonneville Power Administration
- Bureau of Reclamation
- Geological Survey
- National Park Service

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-2000 LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712

551.573
Un36wwsd

United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington

Washington Water Supply Outlook

March 1, 1986

The Library of the
APR 10 1986
University of Illinois
at Urbana-Champaign

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

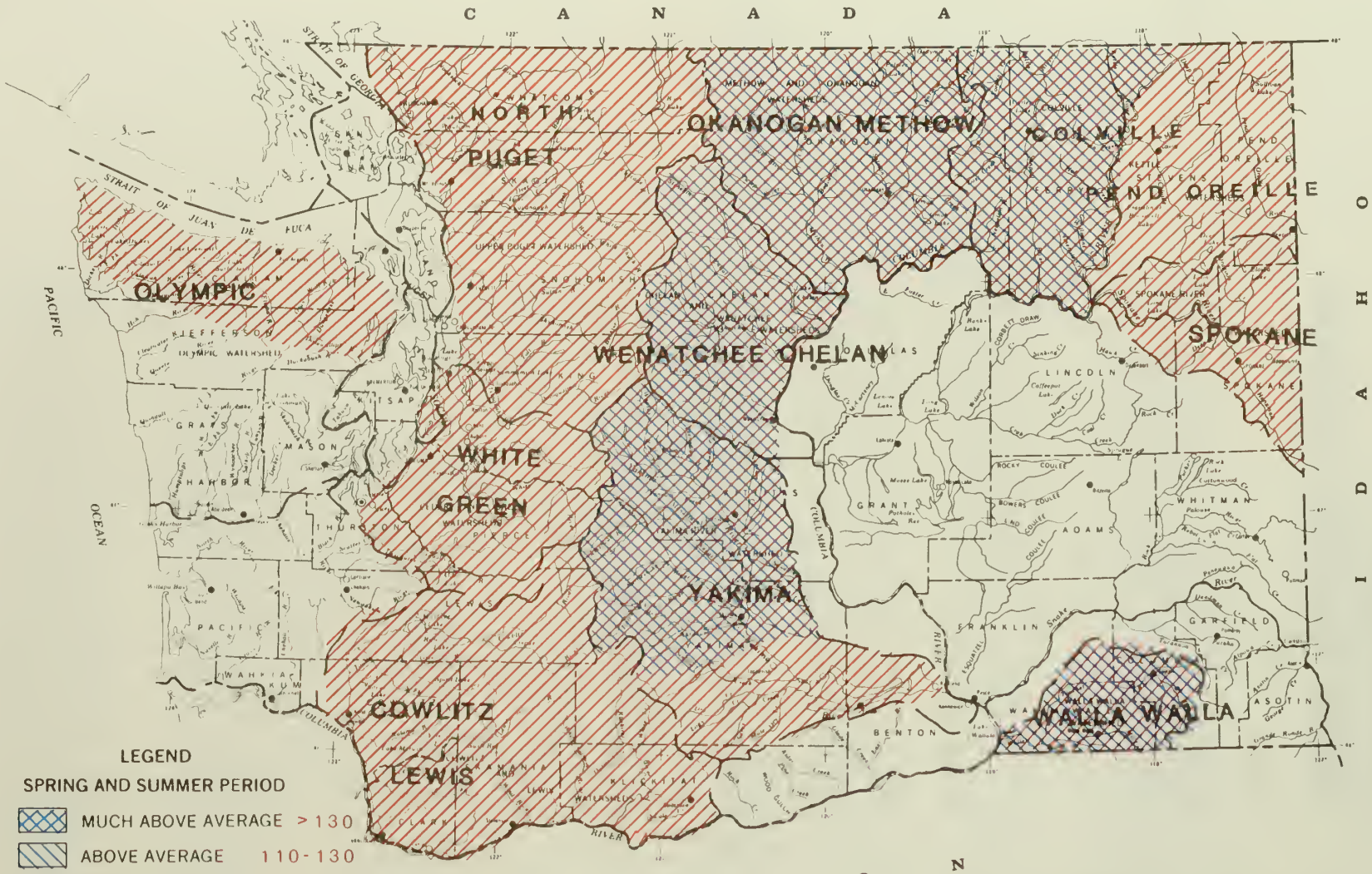
Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA are available to everyone without regard to race, creed, color, sex, age, handicap or national origin.

U S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



LEGEND

SPRING AND SUMMER PERIOD

- MUCH ABOVE AVERAGE >130
- ABOVE AVERAGE 110-130
- NEAR AVERAGE 90-110
- BELOW AVERAGE 70-90
- MUCH BELOW AVERAGE <70
- NOT FORECAST
- WATERSHED BOUNDARY

MARCH 1, 1986

STREAMFLOW PROSPECTS WASHINGTON

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Data compiled by SCS Field Personnel.

JANUARY 1986 4 R 39641

BASE 4 R 39260

GENERAL OUTLOOK

SUMMARY:

The snowpack for March 1 is below average except for parts of Wenatchee, Chelan and the Walla Walla drainages. February precipitation was above average. Spring like temperatures were felt statewide during February. The above normal precipitation and near normal temperature had streamflow at or above normal statewide. Reservoir storage showed some improvement statewide. Forecasted stream flows are slightly improved over February.

SNOWPACK:

March 1 snowpack was varied over Washington with a high of 125% on the Stemilt Creek drainage, and a low of 43% of normal on the Cedar River. The Yakima Basin snowpack is at 87% of average, while the Spokane, Okanogan and Pend Oreille Basins are near 80%. Snowpack around Mt. St. Helens is near 77% of normal. The Puget Sound rivers of the Elwah, Snoqualmie and Baker are below 70% of average.

PRECIPITATION:

February precipitation was above average for all the basins in the state. Highest was the Walla Walla Basin where 292% of normal fell during the month. The Walla Walla weather station reported 4.12 inches compared to the February average of 1.41. The Wenatchee Basin had 180% of normal precipitation. The lowest was the Olympic Basin where precipitation was 115% of average. Other basin readings were; Spokane 129%, Okanogan 152% Yakima 134%, Cowlitz-Lewis 127% and the North Puget Sound 128%.

RESERVOIRS:

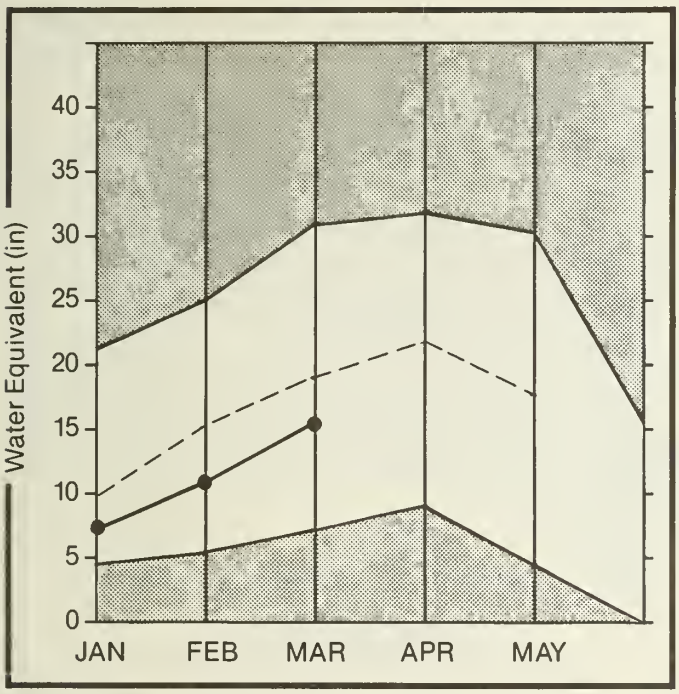
Reservoir storage improved during February, with the Puget Sound reservoirs at 97% of normal and Chelan Lake at 101% of average. The Yakima reservoirs remain below normal at 80%, storing 555,200 acre feet compared to the average of 697,000 acre feet. The Okanogan reservois are at 104% of normal.

STREAMFLOW

February streamflow was above normal over most of Washington. Above normal precipitation coupled with above average temperatures allowed much of the low elevation snow to melt. Some February streamflows around the state were; Spokane 102%, Columbia @ the International Boundary 107%, Chelan 114%, Wenatchee 126%, Yakima 96%, Walla Walla 193%, Cowlitz 136% and the Skykomish 159%. Forecasted streamflows for the coming summer are for near average on the eastern side and for below average for western Washington.

SPOKANE

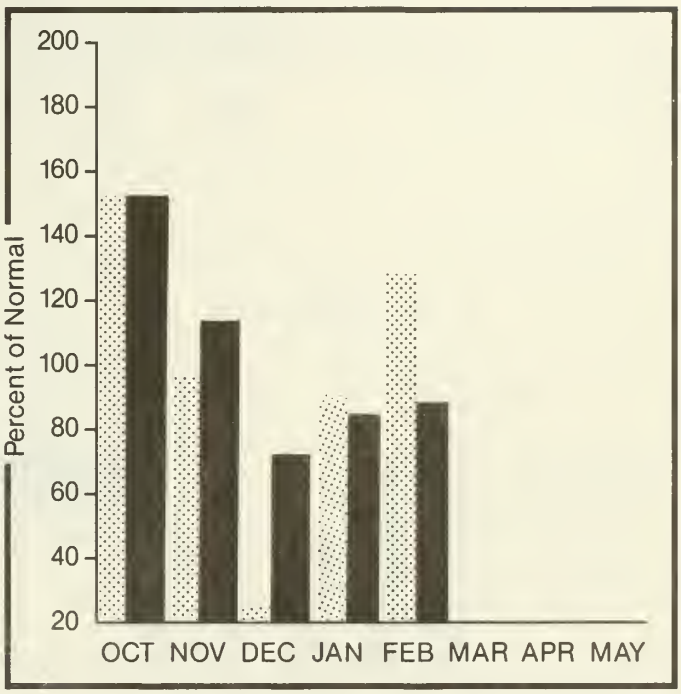
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Snowcover in the Spokane Drainage is 81% of normal for the March 1st measurements. This is up from the 69% for February. February Precipitation was 129% of average, bringing the water year total to 87%. Streamflows are forecasted to be 70% of normal for the summer. Above average precipitation and normal temperatures combined to bring melt to the low elevation snowpack. Streamflow in the Spokane River was 102% of normal at Post Falls. Storage in Coeur d' Alene Lake increased to 129% of normal.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	APR-SEP	2848.0	2000.0	70	103	37				
	APR-JUL	2754.0	1930.0	70	103	37				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.
COEUR D'ALENE	225.1	283.0	19.5	142.0

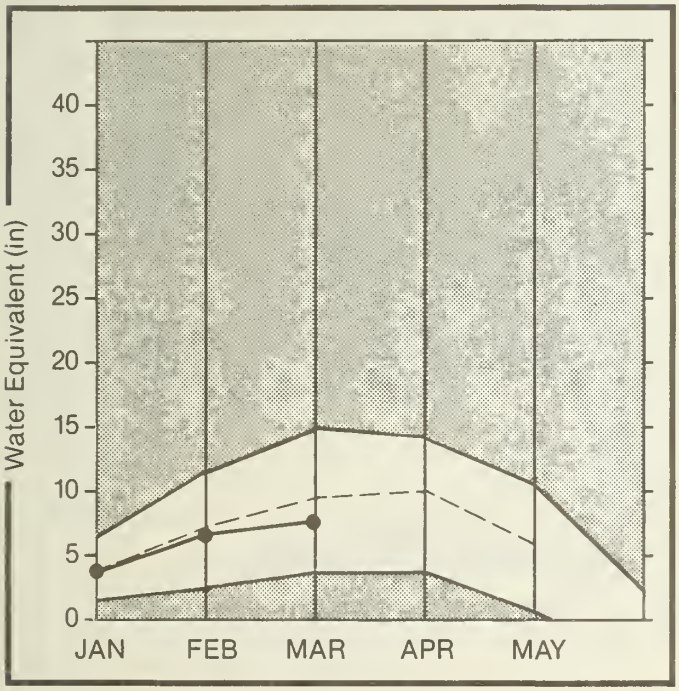
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Spokane River	17	65	76

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

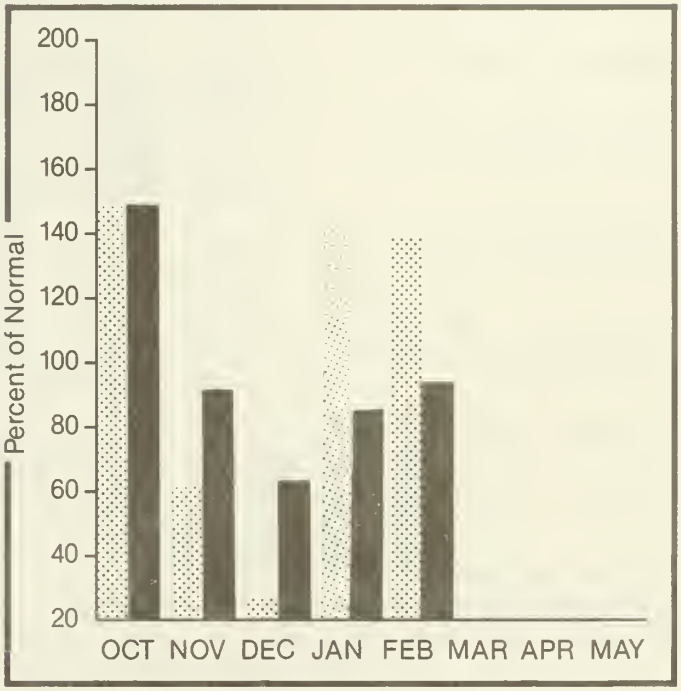
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover improved on the Pend Oreille River from 70% to 78% of normal, but reduced in the Kettle from 95% to 84% and Colville from 85% to 78%. February precipitation was 139% of normal. Streamflows were 114% of average in the Pend Oreille and 134% in the Kettle River. Forecasted streamflows are for 82% in the Pend Oreill, 90% in the Kettle and 80% in the Colville. Streamflows in the Columbia River were at 107% of normal for February and are forecasted to be 93% for the spring and summer.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	12600.0	81	101	63				
	APR-JUL	14156.0	11600.0	81	101	63				
	APR-JUN	12227.0	10100.0	82	102	64				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	107.0	79	129	31				
	APR-JUL	123.0	100.0	81	130	33				
	APR-JUN	114.0	93.5	82	131	33				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1650.0	90	122	58				
	APR-JUL	1738.0	1560.0	89	122	58				
	APR-JUN	1581.0	1440.0	91	123	59				
COLUMBIA RIVER at Birchbank *	APR-SEP	44605.0	44300.0	99	118	80				
	APR-JUL	35705.0	35500.0	99	118	80				
	APR-JUN	26027.0	25770.0	99	118	80				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	62200.0	93	106	80				
	APR-JUL	56169.0	52300.0	93	106	80				
	APR-JUN	44036.0	41000.0	93	106	80				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROOSEVELT	5232.0	4860.7	2694.0	2763.0
BANKS	715.0	741.4	674.8	606.0

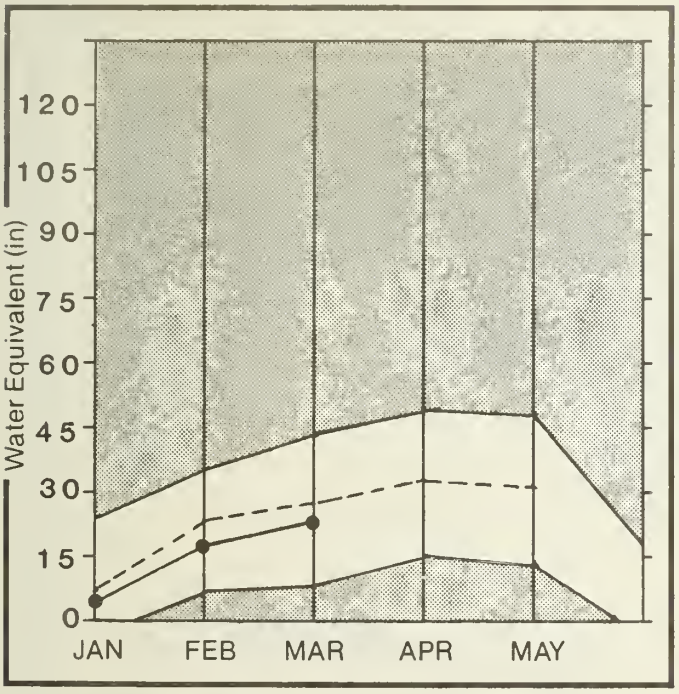
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	3	78	78
Pend Oreille River	12	75	79
Kettle River	9	102	83
Omac Lake, Twin Lakes	0	0	0
Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

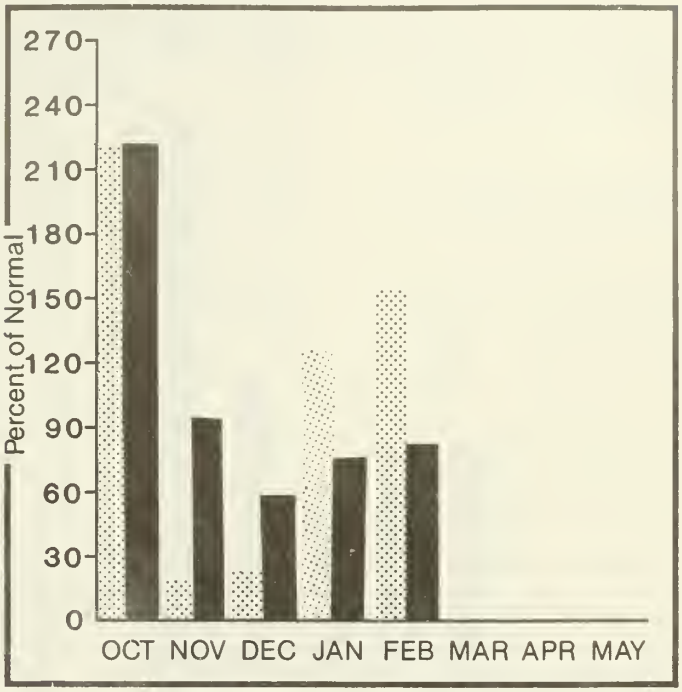
OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation in the Okanogan-Methow Basins was 152% of normal during February. Temperatures averaged degree above normal for the month. Snowcover was 83% of average on the Okanogan and 79% on the Methow River drainages. Reservoir storage is at 104% of the 20 year average, with 14,500 acre feet in storage. Forecasted streamflow for the Okanogan is 95% and on the Methow is 96% of normal.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1400.0	95	126	66				
	APR-JUL	1365.0	1310.0	95	126	66				
	APR-JUN	1161.0	1130.0	97	127	67				
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1560.0	94	129	61				
	APR-JUL	1497.0	1420.0	94	129	61				
	APR-JUN	1262.0	1210.0	95	130	62				
METHOW RIVER nr Pateros	APR-SEP	980.0	936.0	95	126	66				
	APR-JUL	908.0	865.0	95	125	65				
	APR-JUN	773.0	745.0	96	126	66				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

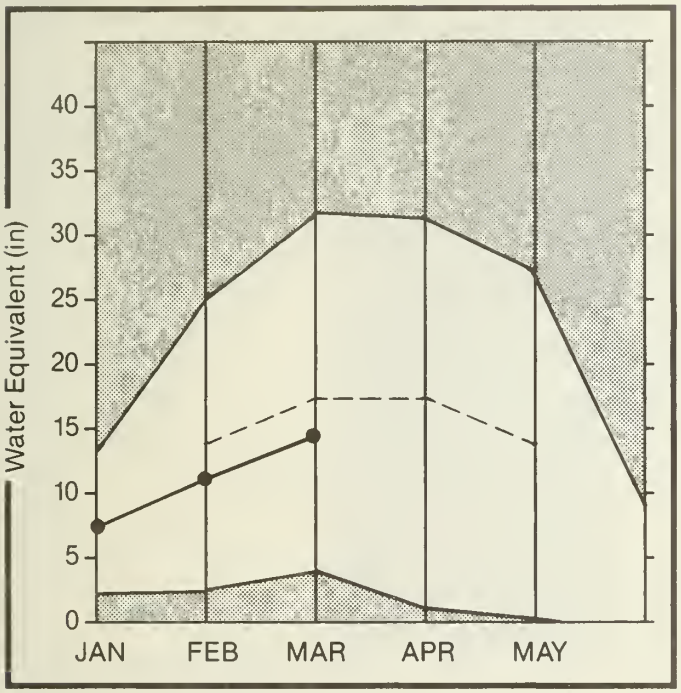
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Okanogan River	28	91	84
Methow River	4	92	83

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

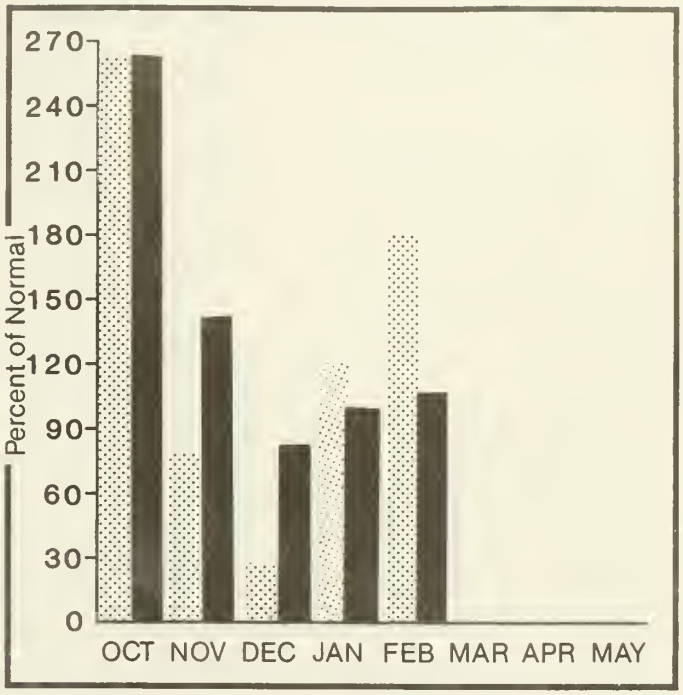
WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover remained near the season norm with 103% in the Chelan, 96% in the Entiat and 91% for the Wenatchee Basin. Precipitation for February was 180% of normal, with Lake Wenatchee reporting 8.1 inches compared to an average of 3.38. February streamflow was above average with the Wenatchee at 126% and the Chelan at 114%. Storage in Chelan Lake was at 101% of the March 1st normal. Forecasted streamflow for the spring and summer are Chelan 98%, Entiat 95%, Wenatchee 95% and the Stemilt 95%.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1180.0	98	117	79				
	APR-JUL	1055.0	1030.0	97	117	79				
	APR-JUN	826.0	810.0	98	117	79				
STEHEKIN R. at Stehekin	APR-SEP	860.0	860.0	100	113	87				
	APR-JUL	727.0	727.0	100	113	87				
	APR-JUN	553.0	560.0	101	114	88				
ENTIAT RIVER nr Ardenvoir	APR-SEP	234.6	222.0	94						
	APR-JUL	213.0	202.0	94						
	APR-JUN	172.0	165.0	95						
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1240.0	97	130	66				
	APR-JUL	1113.0	1090.0	97	130	66				
	APR-JUN	899.0	890.0	98	131	67				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	131.0	95						
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	350.0	94						
	APR-JUL	340.0	325.0	95						
	APR-JUN	270.0	262.0	97						
COLUMBIA R. bl Rock Island Dam *	APR-SEP	72781.0	68800.0	94	110	80				
	APR-JUL	61601.0	58300.0	94	110	80				
	APR-JUN	48384.0	45900.0	94	110	80				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CHELAN LAKE	676.1	238.4	159.9	---

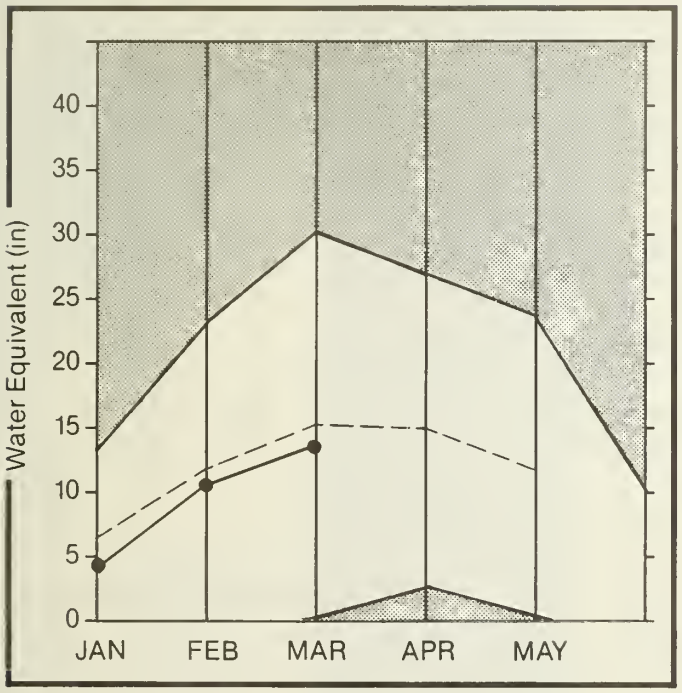
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	6	125	96
Entiat River	2	128	97
Wenatchee River	7	88	92
Colockum Creek	1	89	76
Squilchuck Creek	1	141	108
Stemilt Creek	1	120	99

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

Mountain snowpack* (inches)



*Based on selected stations

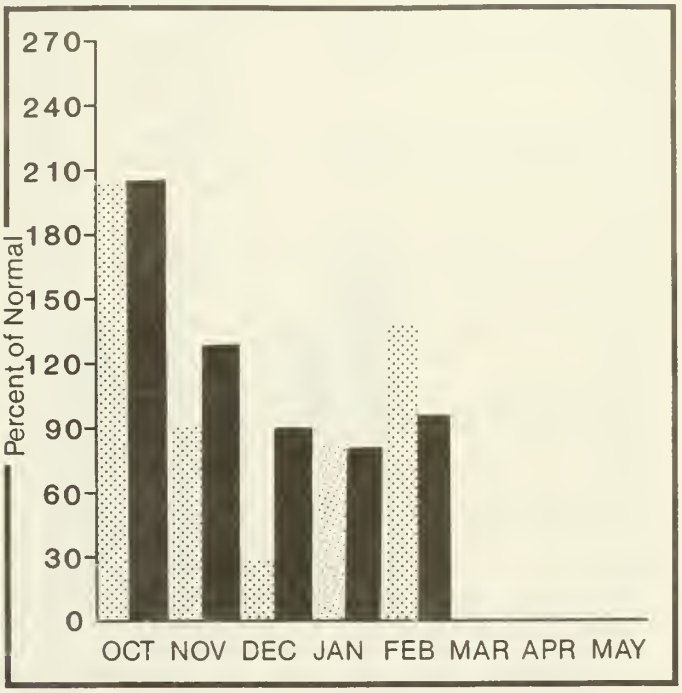
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Snowcover remained constant with 87% of average over the Yakima Basin. Streamflows are forecasted to be 91% on the Yakima and 95% on the Naches River. Precipitation for February was 134% of normal, with late month precipitation falling as rain. Reservoir storage is 80% of the 20 year average, with 560,000 acre feet in storage. Temperatures averaged 1 degree below average, with the last two weeks being above normal. Streamflow in the Yakima for February was 96% of average.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	126.0	90	102	79				
	APR-JUL	128.0	116.0	90	102	79				
	APR-JUN	111.0	102.0	91	103	80				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	849.0	90	101	79				
	APR-JUL	854.0	770.0	90	101	79				
	APR-JUN	734.0	670.0	91	102	80				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1940.0	92	112	74				
	APR-JUL	1898.0	1760.0	92	112	74				
	APR-JUN	1667.0	1570.0	94	113	75				
KACHESS RIVER nr Easton *	APR-SEP	121.0	109.0	90	102	79				
	APR-JUL	115.0	104.0	90	102	79				
	APR-JUN	101.0	92.0	91	103	80				
CLE ELUM RIVER nr Roslyn *	APR-SEP	463.0	426.0	92	103	81				
	APR-JUL	422.0	390.0	92	103	81				
	APR-JUN	353.0	330.0	93	104	82				
BUMPING RIVER nr Nile *	APR-SEP	142.0	135.0	95	116	74				
	APR-JUL	129.0	123.0	95	116	74				
	APR-JUN	107.0	103.0	96	117	76				
AMERICAN RIVER nr Nile	APR-SEP	124.0	118.0	95	116	74				
	APR-JUL	113.0	107.0	94	116	73				
	APR-JUN	94.0	90.0	95	117	74				
TIETON RIVER at Tieton *	APR-SEP	246.0	237.0	96	117	75				
	APR-JUL	207.0	198.0	95	117	75				
	APR-JUN	165.0	160.0	96	118	75				
NACHES RIVER nr Naches *	APR-SEP	867.0	823.0	94	118	72				
	APR-JUL	784.0	744.0	94	118	72				
	APR-JUN	667.0	640.0	95	119	73				
AHTANUM CREEK nr Tampico *	APR-SEP	47.0	38.0	80	119	43				
	APR-JUL	43.0	34.8	80	119	42				
	APR-JUN	37.0	30.3	81	119	43				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
KEECHELUS	157.8	81.9	83.5	105.0
KACHESS	239.0	128.6	154.4	179.0
CLE ELEM	436.9	173.7	179.1	273.0
BUMPING LAKE	33.7	17.2	3.8	10.0
RIMROCK	198.0	153.8	84.2	130.0

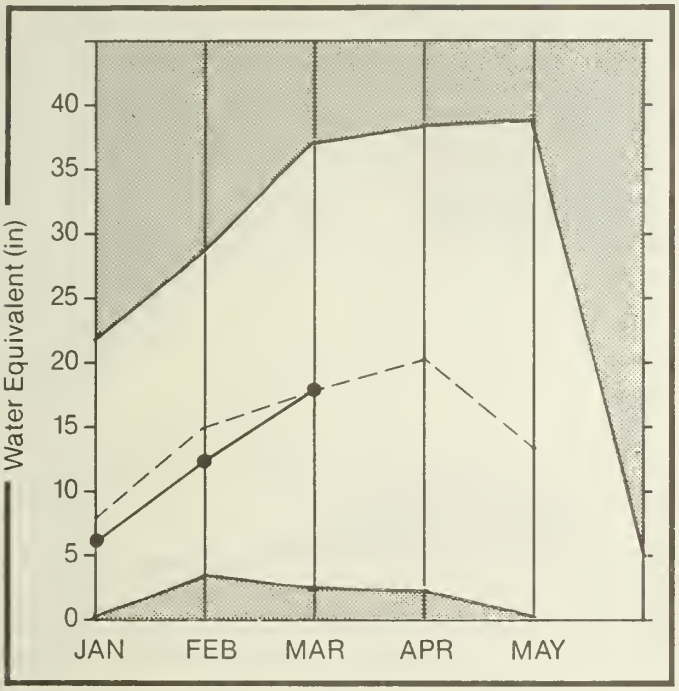
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	15	107	86
Ahtanum Creek	2	139	71

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

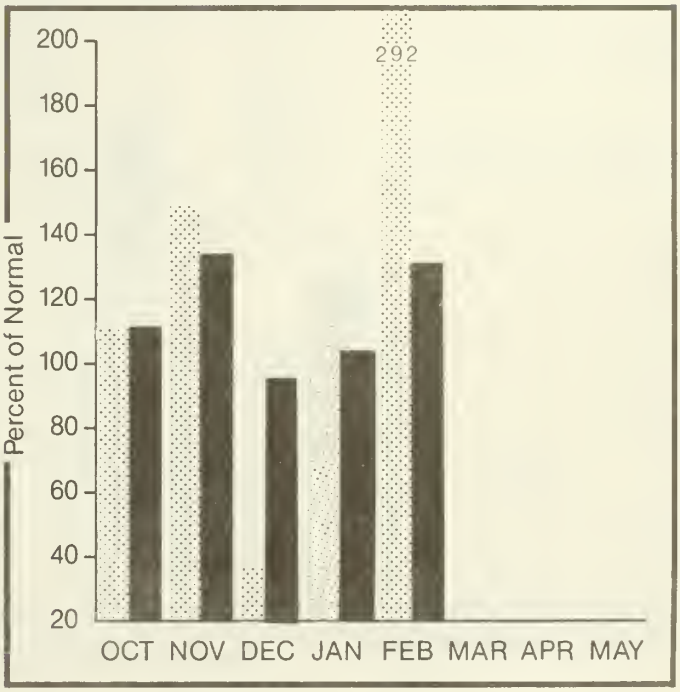
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflow in the Walla Walla River was 193% of normal for February. Precipitation for February was 292% of average. with temperatures normal for the month. Temperatures were above average for the last two weeks of February and along with the high precipitation caused much of the low elevation snow to melt. Streamflows are forecasted to be near normal with the Walla Walla River at 96% for the summer.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	30 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK at Walla Walla	APR-SEP	17.5	16.8	96	126	69				
	APR-JUL	17.3	16.6	95	127	69				
	APR-JUN	17.1	16.5	96	122	70				
COLUMBIA R. at The Dalles *	APR-SEP	101000.0	95000.0	94	111	77				
	APR-JUL	86500.0	81100.0	93	111	77				
	APR-JUN	70100.0	65900.0	94	111	77				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

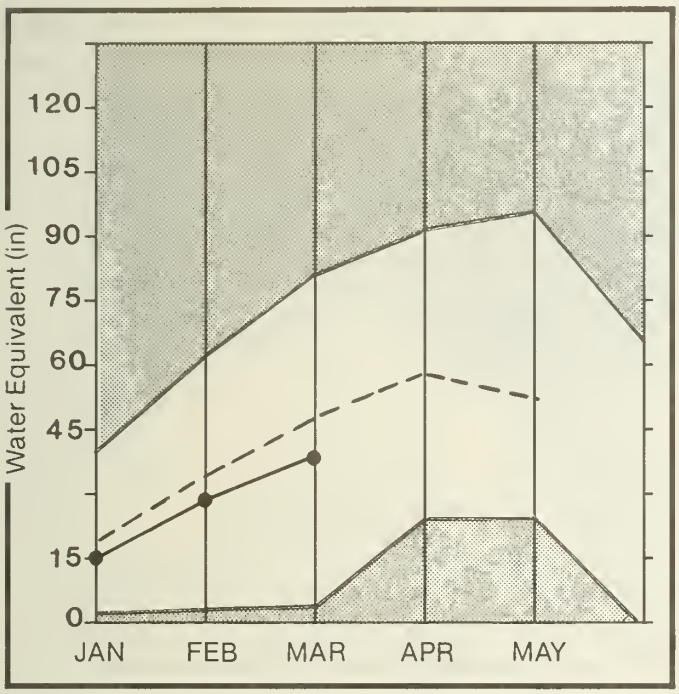
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Mill Creek	1	58	102

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

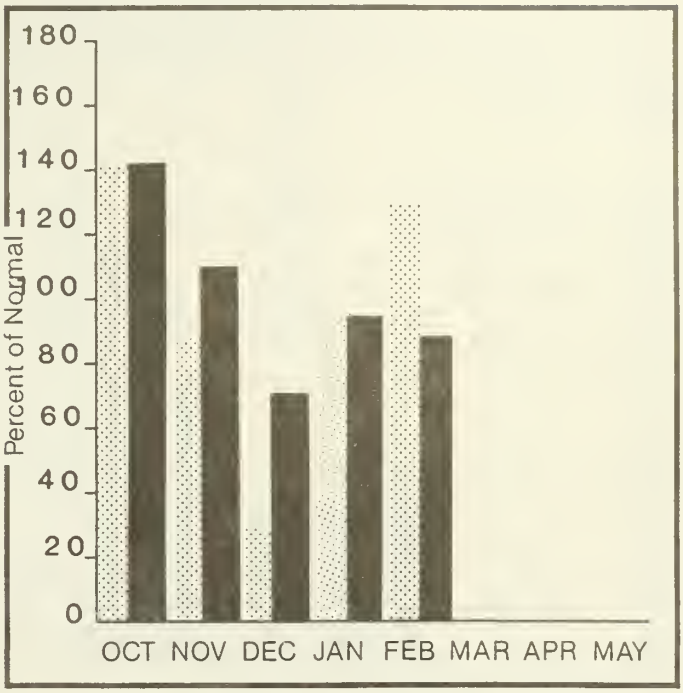
COWLITZ AND LEWIS

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflows are forecasted to be 85% on the Cowlitz River and 84% on the Lewis River this summer. February streamflow on the Cowlitz River was 136% of normal. Snowcover for the March 1st snow measurements were at 77% of normal down from the 94% of normal for February 1. Precipitation for February was 127% of average, with much of it falling as rain. Temperatures for the month were near normal.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1050.0	84	114	54				
	APR-JUL	1086.0	912.0	83	114	54				
	APR-JUN	961.0	820.0	85	115	55				
COWLITZ R. bl Mayfield Dam *	APR-SEP	2038.0	1670.0	81	120	44				
	APR-JUL	1778.0	1460.0	82	120	44				
	APR-JUN	1502.0	1250.0	83	121	45				
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2270.0	84	120	50				
	APR-JUL	2323.0	1975.0	85	120	50				
	APR-JUN	1980.0	1710.0	86	121	51				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

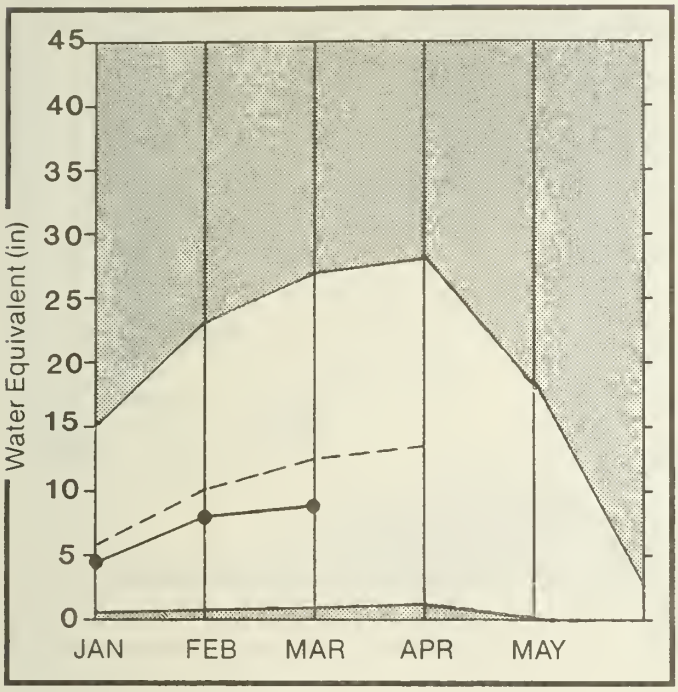
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Cowlitz River	2	105	74
Lewis River	2	82	90

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

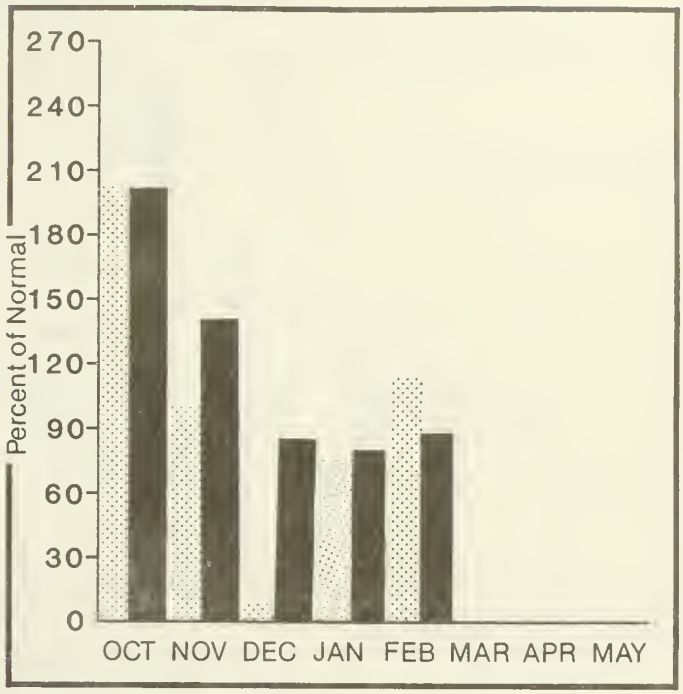
WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum — Minimum — Average — Current

Monthly precipitation — Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover continued to be below average in the Green and Cedar Rivers with 66% and 43% of normal. The White River is only slightly better with 85% of average. Streamflows were above average for February and the forecasted streamflows are 80% for the Green River and 83% for the Cedar River. Precipitation for February was 116% of normal, with temperatures near average for the month.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	255.0	80						
	APR-JUL	284.0	230.0	80						
	APR-JUN	256.0	210.0	82						
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	77.0	82						

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

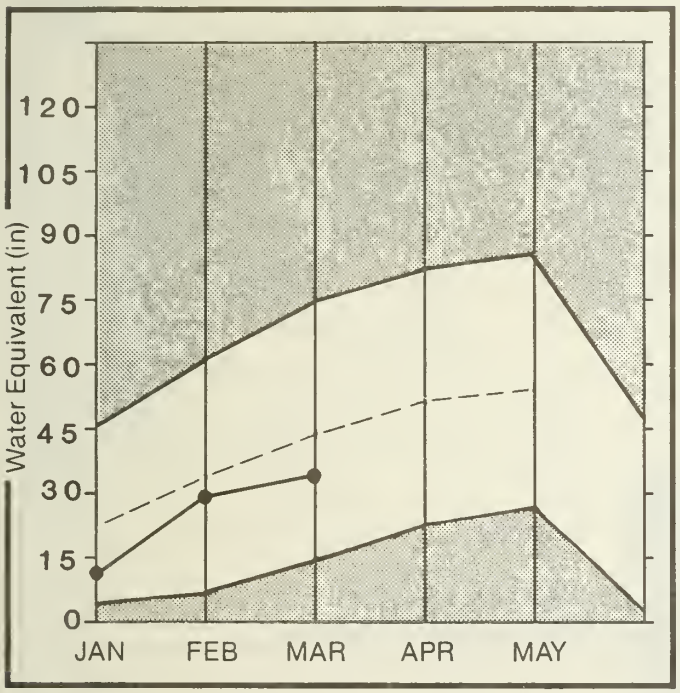
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
White River	2	112	77
Green River	9	47	64

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

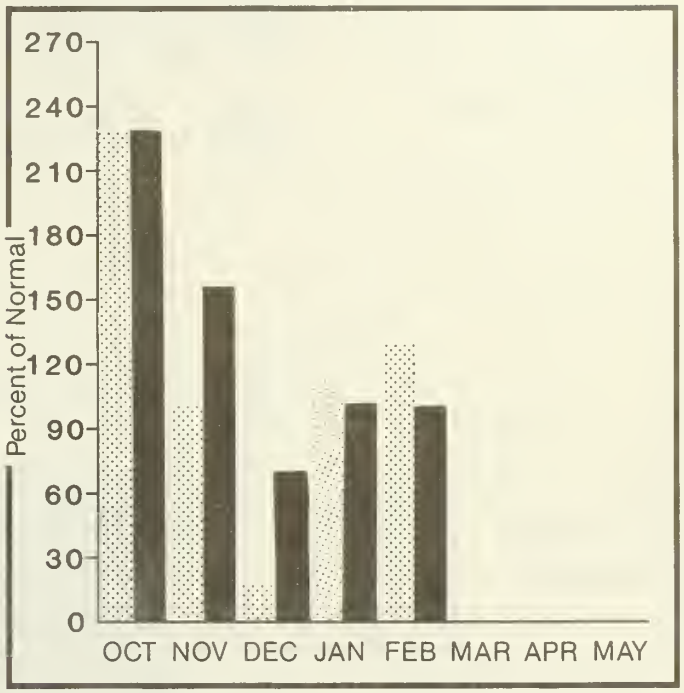
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover remained much the same as last month with the Skagit River at 90% of average and the Baker River at 66%. Streamflows are forecasted to be 85% of average on the Skagit. February precipitation was 128% of normal for the North Puget Sound, with Diablo Dam receiving 11.87 inches for the month. Streamflow for February was 159% of average for the Skykomish River. Reservoir storage in Ross, Diablo and Gorge was at 97% of normal.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	2000.0	84	103	67				
	APR-JUL	1972.0	1680.0	85	103	67				
	APR-JUN	1485.0	1270.0	85	104	68				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROSS	1404.1	869.2	684.3	---
DIABLO RESERVOIR	90.6	85.6	84.9	---
GORGE RESERVOIR	9.8	7.6	7.9	---

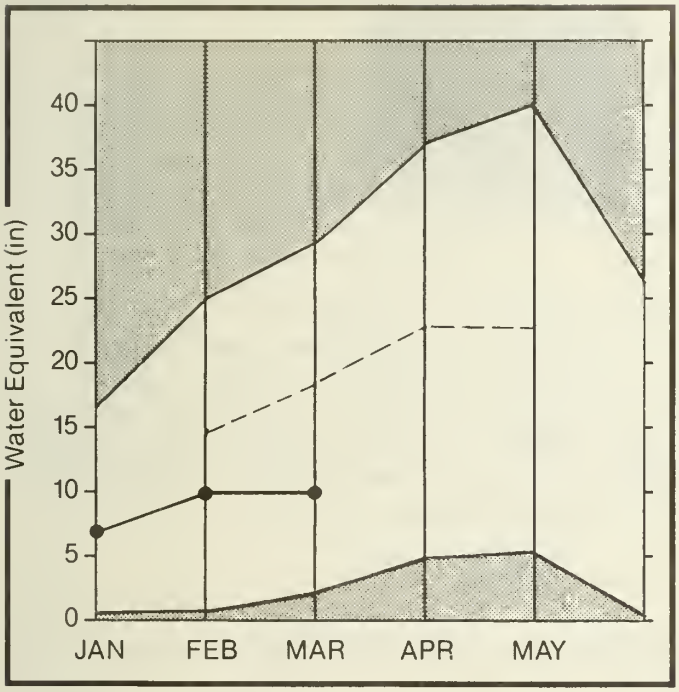
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Skagit River	14	101	91
Baker River	9	64	63
Cedar River	2	32	43
Snoqualmie River	1	89	82
Stillaguamish River	2	74	72

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OLYMPIC

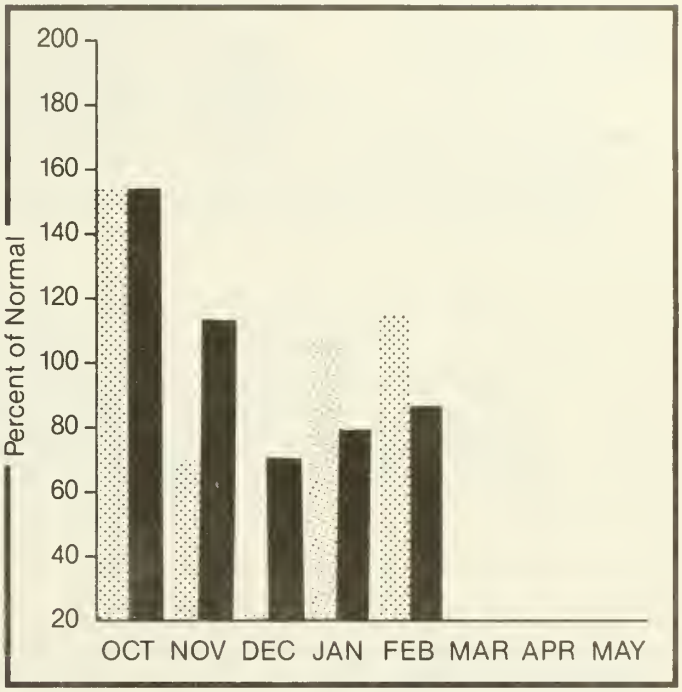
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowcover in the Olympic Peninsula remained much below average, with the Elwa at 50%, the Dungeness at 64% and Morse Creek at 78%. Streamflows are forecasted to be 75% of normal for the summer. Precipitation was 115% of normal for February with the Quillayute Airport having 12.27 inches of moisture. The water year total is now 86% of normal up from 79% last month.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	APR-SEP	160.0	120.0	75	93	57				
	APR-JUL	130.0	97.5	75	93	57				
	APR-JUN	97.0	72.8	75	93	57				
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	414.0	74						
	APR-JUL	454.0	340.0	74						

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Dungeness River	1	60	64
Morse Creek	1	78	79
Elwha River	1	55	50

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

RESERVOIR OPERATION MANAGEMENT PROGRAM

The Soil Conservation Service can develop a Reservoir Operation and Management plan for cooperators with the Soil Conservation Districts in Washington. If you are operating a reservoir for irrigation water supply, power generation or other use this may be of some value to you.

Selecting appropriate storage and release rates for reservoirs in snowmelt runoff environments is a prerequisite to sound water management. A significant number of small impoundments, operated for single or multiple purpose use in the Western United States, lack adequate management tools to guide this process each year. A methodology has been developed and approved to use seasonal volume forecasts issued by Soil Conservation Service to improve management capability at many of these reservoirs.

The technique involves generating a family of simple rule curves for each forecast period. These curves permit operators to use predicted inflow volume to set target outflow rates that will enable them to reach a full reservoir after passage of the seasonal peak. Forecasts at three probability levels help establish the range of likely seasonal runoff events. The rule curves provide an operational tool useful for developing effective water management plans for reservoirs where forecast information is available.

Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC

Office		(509) 335-7376
Farm		(509) 335-9689

OLYMPIA, Area I

Area Office	FTS	434-9454 or 9455
Chehalis		(206) 748-0083
Kelso		(206) 425-1880
Lake Stevens	FTS	392-9259
Lynden		(206) 354-5658
Montesano		(206) 249-5900
Mt. Vernon		(206) 424-5153
Olympia FO	FTS	434-9448
Port Angeles	FTS	396-4277
Port Orchard		(206) 876-5529
Puyallup		(206) 845-5533
Raymond		(206) 942-5945
Renton	FTS	399-3325 or 3326
Vancouver	FTS	422-7631

EPHRATA, AREA II

Area Office	FTS	446-4374 or 4375
Davenport		(509) 725-4181 or 725-1345
Ephrata FO	FTS	446-4385
Moses Lake		(509) 765-3261
Okanogan		(509) 422-2750
Othello		(509) 488-2802
Ritzville		(509) 659-0254
Waterville		(509) 745-8362
Wenatchee	FTS	390-0242 or 0260

YAKIMA, AREA III

Area Office	FTS	446-5865 or 5866
Ellensburg		(509) 925-5375
Goldendale		(509) 773-5823
Pasco		(509) 545-8546 or 8547
Prosser		(509) 786-1923
Sunnyside		(509) 837-7911
Toppenish		(509) 865-4012
Walla Walla	FTS	434-6340
White Salmon		(509) 493-1936
Yakima FO	FTS	446-5909

SPOKANE, AREA IV

Area Office	FTS	439-3726
Cheney		(509) 458-6200, Ext 2309
Clarkston		(509) 758-8012
Colfax		(509) 397-4636
Colville		(509) 684-5067
Dayton		(509) 382-2351
Fairfield		(509) 283-2331
Newport		(509) 447-4217
Pomeroy		(509) 843-1998
Republic		(509) 775-3473
Spokane FO	FTS	439-2120

SOIL SURVEY OFFICES

Bellingham		(206) 676-3520
Inchelium		(509) 722-4395
Nespelem	FTS	439-9431
Wapato		(509) 877-4004

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
- Corps of Engineers

U.S. Department of Agriculture
- Forest Service

U.S. Department of Commerce
- NOAA, National Weather Service

U.S. Department of the Interior
- Bonneville Power Administration
- Bureau of Reclamation
- Geological Survey
- National Park Service

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-2000 LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712

551.573
Un3lewwa

United States
Department of
Agriculture

Soil
Conservation
Service

Spokane,
Washington

Washington Water Supply Outlook

April 1, 1986

The Library of the
MAY 05 1986
University of Illinois
at Urbana-Champaign

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

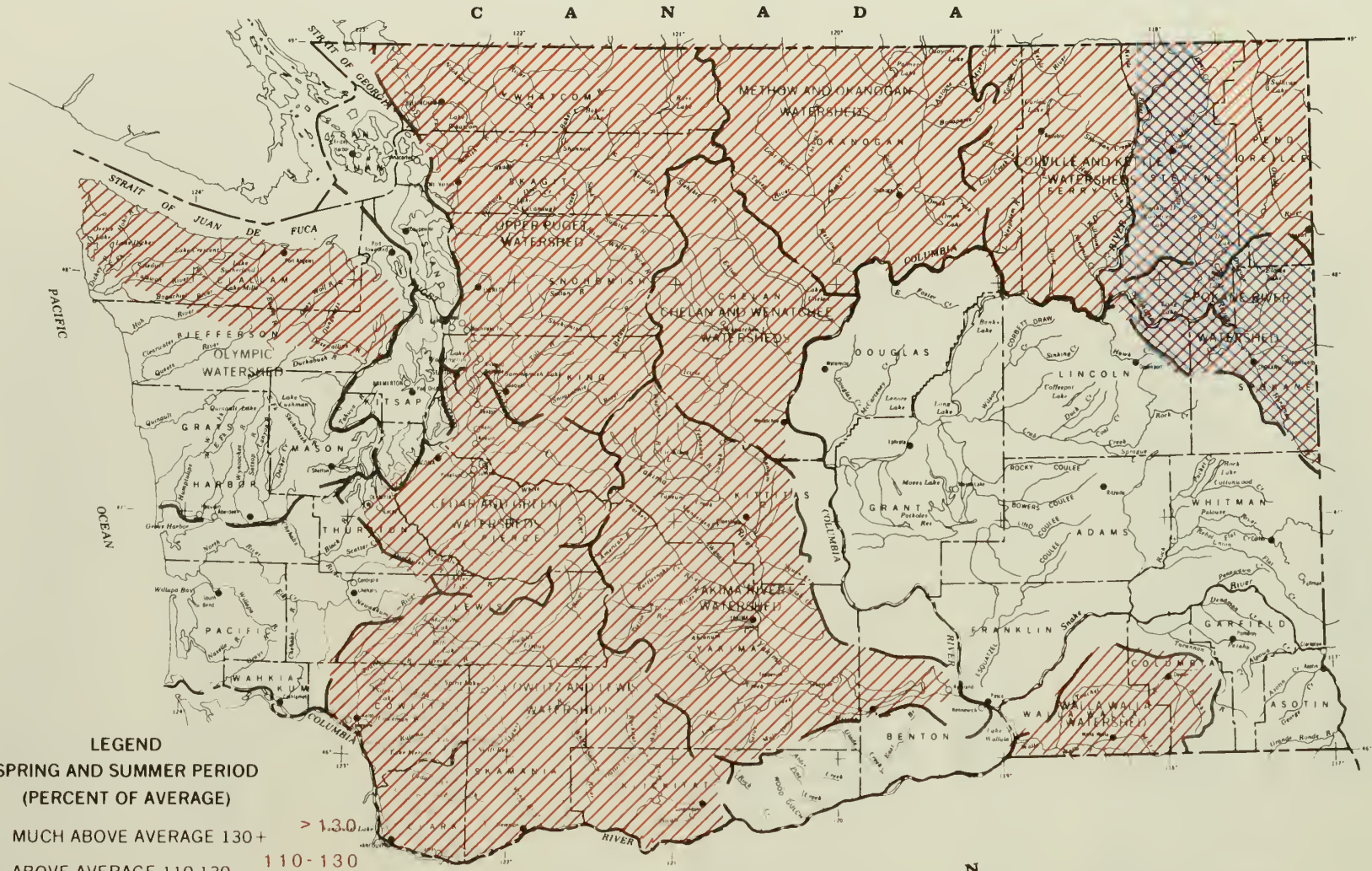
Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA are available to everyone without regard to race, creed, color, sex, age, handicap or national origin.

U S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



APRIL 1, 1986
STREAMFLOW PROSPECTS
WASHINGTON

SOURCE: Data compiled by SCS Field Personnel.

JANUARY 1986 4 R 39641

BASE 4 R 39260

GENERAL OUTLOOK

SUMMARY:

Spring snowmelt occurred over most of Washington State during March. Streamflow was above normal in most of the major rivers. With the added streamflow, reservoir storage improved with the Yakima reservoirs going from 80% of normal to 92% of average. Temperatures were above average during March. Precipitation was near normal to slightly below normal in all sections of Washington except Walla Walla which was much above average. Streamflows are forecasted to be below normal over Washington for the coming summer months.

SNOWPACK:

The Stemilt Drainage near Wenatchee is the only area of Washington with above average snowpack. The rest of the state is below average to much below average. Snowpack on the Olympic Basin is the lowest in the state with 33% of normal on the Elwah River and 43% on the Dungeness. Other readings in the Puget Basins include; 56% on the Baker River, 77% on the Skagit, 67% on the Skykomish and 45% on the Green River. Some East side snowpacks; Yakima 71%, Wenatchee 69%, Chelan 91%, Okanogan 78%, Pend Oreille 68% and the Spokane River at 58%.

PRECIPITATION:

Precipitation varied over Washington during March, with 186% of average in the Walla Walla to 65% of normal in the Wenatchee drainage. The Walla Walla weather station now has 139% of normal precipitation for the water year to date. Most east side basins were slightly below normal with the following; Spokane 97%, Colville 85%, Okanogan 96% and the Yakima 75%. Some west side basins include the Cowlitz at 79%, the Green River 101%, the north Puget Sound 89% and the Olympic 102%.

RESERVOIRS:

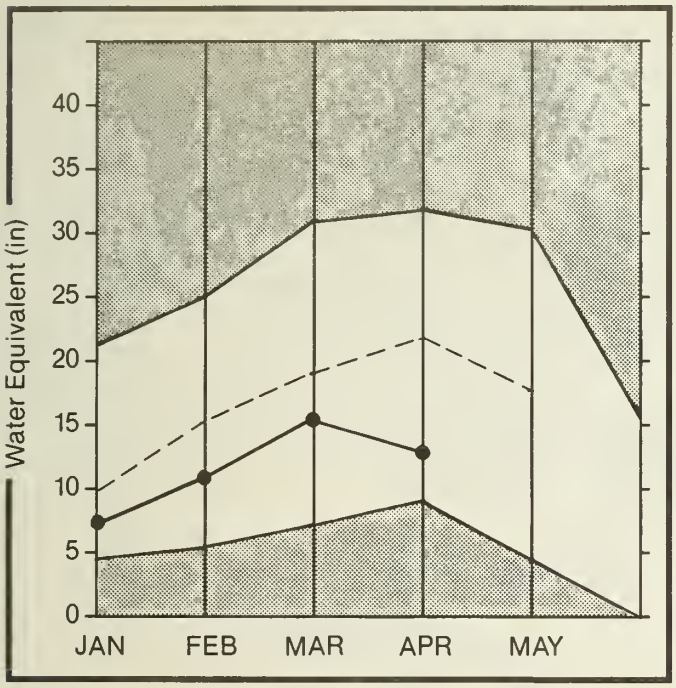
The April 1 reservoir storage shows improvement over the March 1 amounts with the greatest improvement being storage in the Yakima Basin. April 1 storage in the Yakima was 677,400 acre feet or 92% of normal. Capacity for the five major Yakima reservoirs is 1,065,000 acre feet. Chelan Lake is 143% of April 1 average storage and 45% of capacity, holding 302,400 acre feet. Coeur d' Alene Lake is at 99% of capacity. Roosevelt is at 84% of capacity and 278% of the April 1 average. Ross Reservoir is at 67% of capacity and 314% of the April 1 normal storage.

STREAMFLOW:

Streamflows in March were above average in all streams except the Chehalis River, which was 69% of normal. Warm weather with temperatures averaging five degrees above normal and rain brought spring melt nearly one month early to Washington State. Many of the streams were in excess of 200% of normal March runoff with the following; Kettle River 240%, Similkameen 260%, Chelan 211%, Pend Oreille 215%, Wenatchee 230% and the Snake River below Ice Harbor dam 227%. The Columbia River below Grand Coulee was 180% of normal. Streamflows for the summer are forecasted to be below normal for all areas of Washington.

SPOKANE

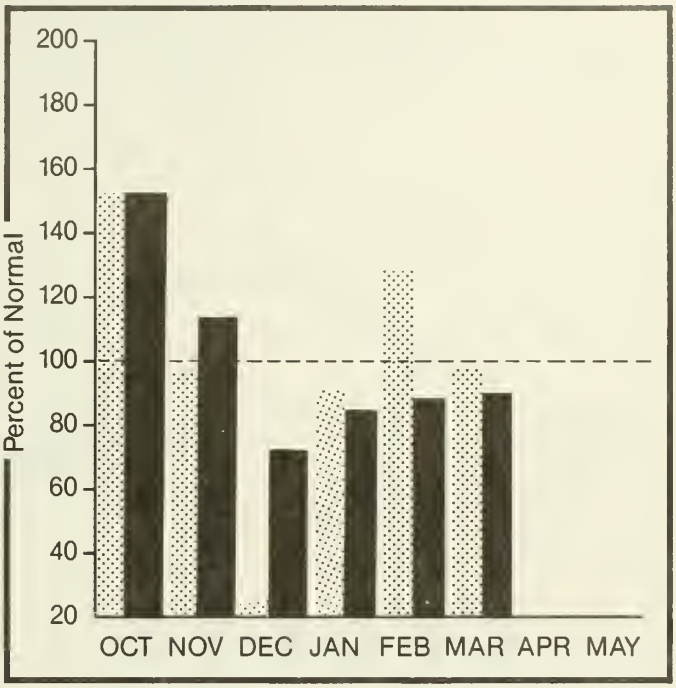
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Warm March temperatures averaging five degrees above normal coupled with near average precipitation reduced the snowpack in the Spokane River Basin. The snowpack went from 81% of normal for March 1st to 58% of normal for April 1st. Precipitation for March was 97% of normal bringing the water year to 91% of average. Streamflow runoff continued above average with March being 198% of normal. Forecasted streamflow for the summer is 60% of average. Reservoir storage in Coeur d' Alene Lake is at 133% of normal.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	APR-SEP	2848.0	1710.0	60	84	36				
	APR-JUL	2754.0	1650.0	59	84	36				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.
COEUR O'ALENE	225.1	223.1	97.1	168.2

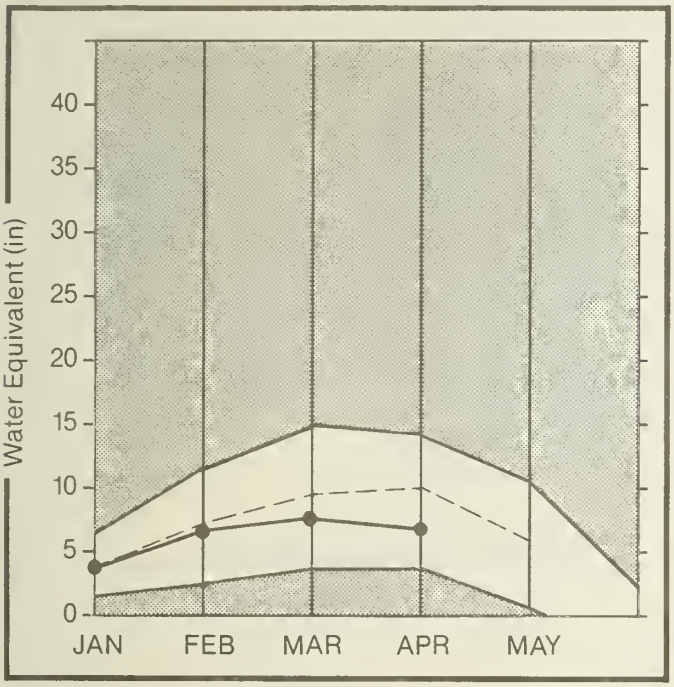
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Spokane River	19	69	75

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

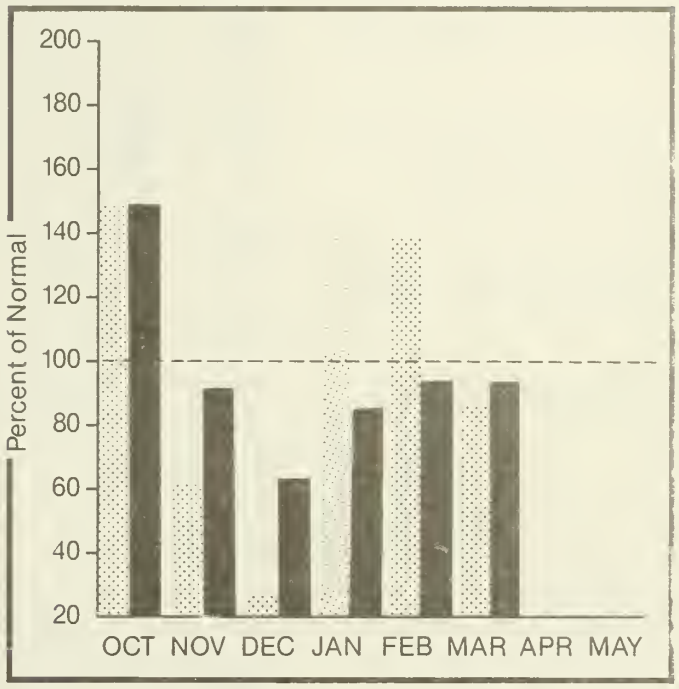
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflow in the Colville-Pend Oreille basin was above average with the Pend Oreille River flowing 215% of normal and the Kettle at 240%. The Columbia River was 180% of average below Grand Coulee. Reservoir storage in Roosevelt was 278% of the April 1 normal with 4,784,700 acre feet of usable storage. Temperatures averaged six degrees above normal for March reducing the snowpack from its March 1 reading of near 80% to a April 1 reading of 61% on the Kettle and 55% on the Colville. Forecasted streamflow for the summer is 73% on the Pend Oreille, 64% on the Colville and 80% on the Kettle.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	11300.0	73	90	56				
	APR-JUL	14156.0	10400.0	73	90	56				
	APR-JUN	12227.0	8930.0	73	90	56				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	87.0	64	104	26				
	APR-JUL	123.0	80.0	65	104	26				
	APR-JUN	114.0	99.0	86	125	48				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1470.0	80	108	52				
	APR-JUL	1738.0	1390.0	79	108	52				
	APR-JUN	1581.0	1260.0	79	108	52				
COLUMBIA RIVER at Birchbank *	APR-SEP	44605.0	43800.0	98	116	80				
	APR-JUL	35705.0	35100.0	98	116	80				
	APR-JUN	26027.0	25500.0	97	116	80				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	59800.0	89	101	77				
	APR-JUL	56169.0	49800.0	88	101	77				
	APR-JUN	44036.0	39200.0	89	101	77				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROOSEVELT	5232.0	4403.4	992.0	1586.0
BANKS	715.0	381.3	672.2	583.0

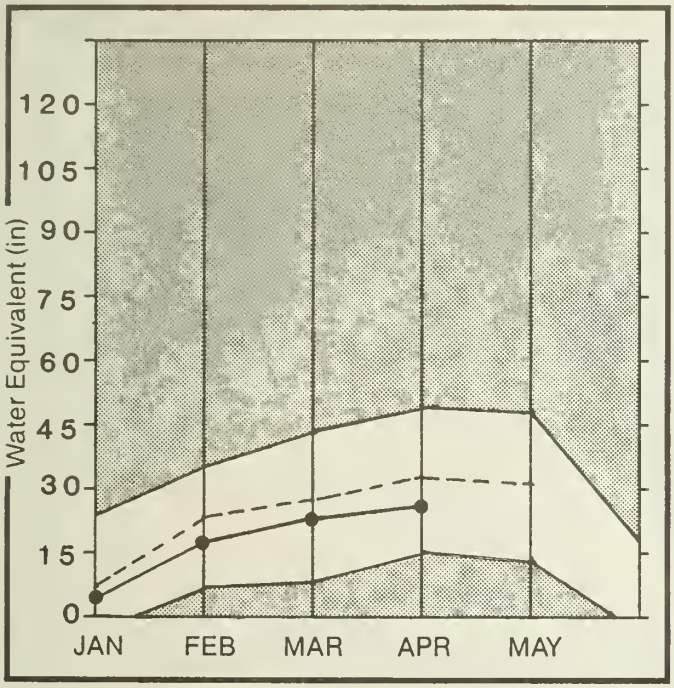
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	3	46	55
Pend Oreille River	12	68	70
Kettle River	9	73	62
Omac Lake, Twin Lakes	0	0	0
Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

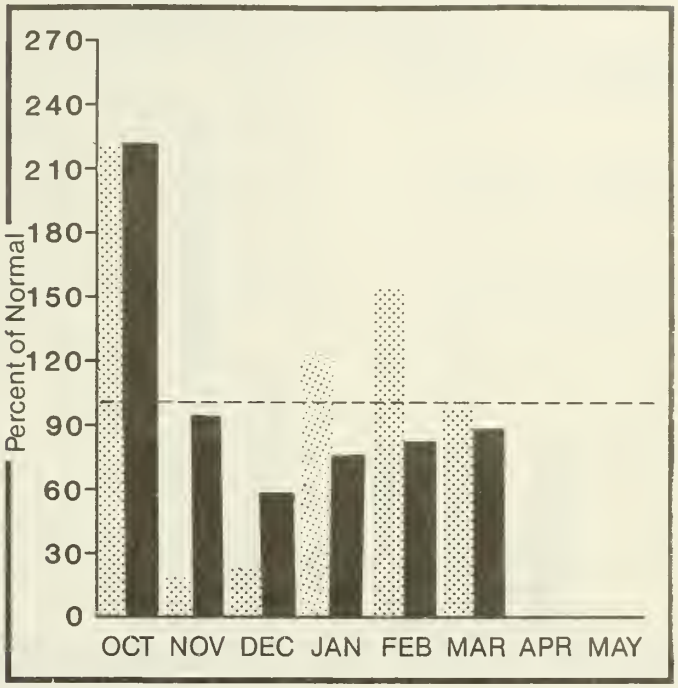
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Temperatures averaging five degrees above normal, coupled with below average precipitation for March produced streamflow of 166% of normal on the Okanogan River. The Similkameen River was 260% of March normal as much of the snowpack melted reducing the April 1 pack to 78% of average on the Okanogan. Snowpack in the Methow Drainage was 77% of average. Reservoir storage for April 1 was 102% of normal with 15,300 acre feet being stored in the Conconully lakes. Streamflows for summer are forecasted to be 80 % on the Okanogan and 88% on the Methow.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1190.0	81	99	63				
	APR-JUL	1365.0	1100.0	80	99	63				
	APR-JUN	1161.0	952.0	81	100	64				
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1320.0	80	103	57				
	APR-JUL	1497.0	1200.0	80	103	57				
	APR-JUN	1262.0	1020.0	80	104	58				
METHOW RIVER nr Pateros	APR-SEP	980.0	870.0	88	115	63				
	APR-JUL	908.0	808.0	88	115	63				
	APR-JUN	773.0	696.0	90	116	64				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CONCONULLY LAKE (SALMON)	10.5	8.0	10.4	8.0
CONCONULLY RESERVOIR	13.0	7.3	13.0	7.0

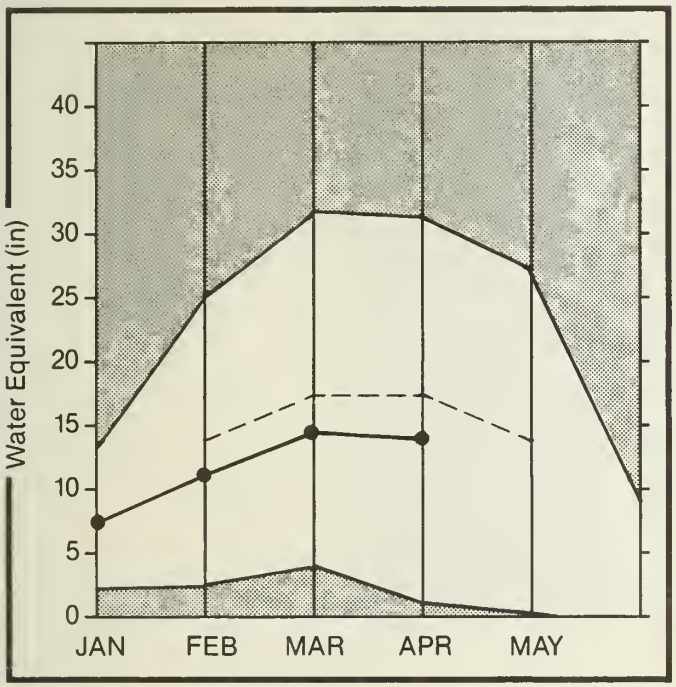
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Okanogan River	30	91	81
Methow River	4	96	84

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

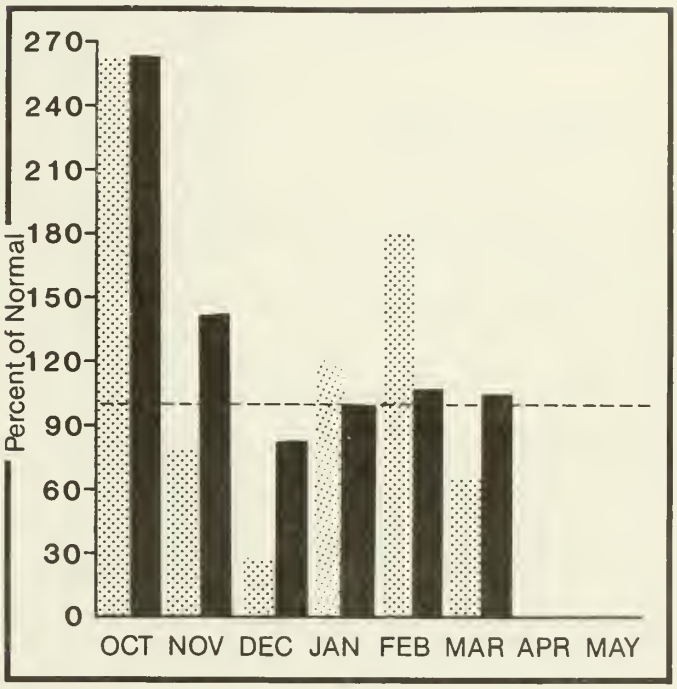
WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum — Minimum — Average — Current

Monthly precipitation — Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Warm temperatures averaging five degrees above normal reduced the basin's snowpack. The Chelan went from 96% for March 1st to 91% for April 1, the Wenatchee from 91% to 69%. The Stemilt maintained its pack at 125% of normal. High temperatures produced above average streamflows with the Wenatchee at 230%, Chelan at 211% and the Columbia at 188%. Streamflows for summer are forecasted to be 84% of normal on the Wenatchee, 89% on the Chelan and 88% on the Entiat. Reservoir storage in Chelan Lake was 302,400 acre feet or 143% of normal.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1080.0	89	107	73				
	APR-JUL	1055.0	935.0	88	106	72				
	APR-JUN	826.0	751.0	90	108	74				
STEHEKIN R. at Stehekin	APR-SEP	860.0	775.0	90	101	79				
	APR-JUL	727.0	656.0	90	101	79				
	APR-JUN	553.0	503.0	90	102	80				
ENTIAT RIVER nr Ardenvoir	APR-SEP	234.6	208.0	88	89	89				
	APR-JUL	213.0	189.0	88	89	89				
	APR-JUN	172.0	155.0	90	90	90				
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1070.0	84	115	53				
	APR-JUL	1113.0	935.0	84	115	53				
	APR-JUN	899.0	755.0	83	115	53				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	110.0	79	80	80				
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	290.0	78	78	78				
	APR-JUL	340.0	265.0	77	78	78				
	APR-JUN	270.0	213.0	78	79	79				
COLUMBIA R. bl Rock Island Dam *	APR-SEP	72781.0	65700.0	90	104	76				
	APR-JUL	61601.0	55100.0	89	103	75				
	APR-JUN	48384.0	43600.0	90	104	76				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CHELAN LAKE	676.1	302.4	138.6	212.1

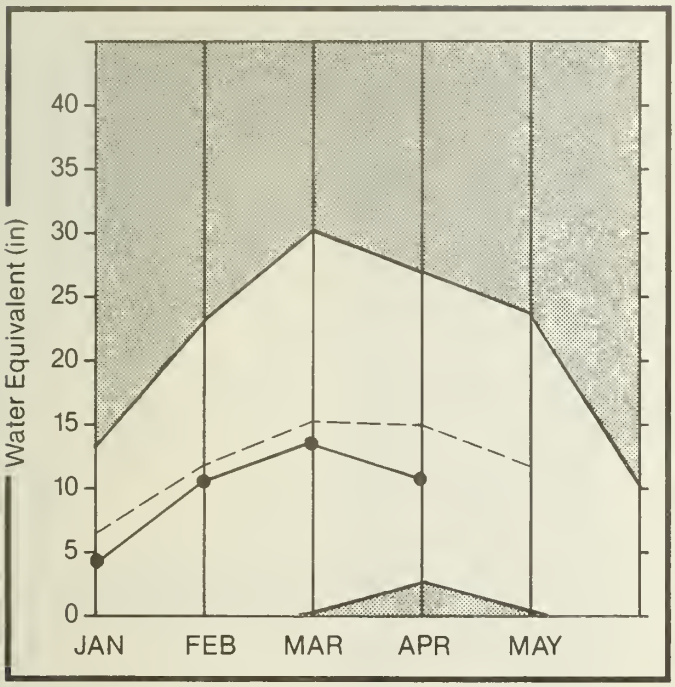
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	6	114	91
Entiat River	7	118	74
Wenatchee River	8	72	69
Colockum Creek	1	22	17
Squilchuck Creek	1	91	86
Stemilt Creek	1	103	85

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

Mountain snowpack* (inches)



*Based on selected stations

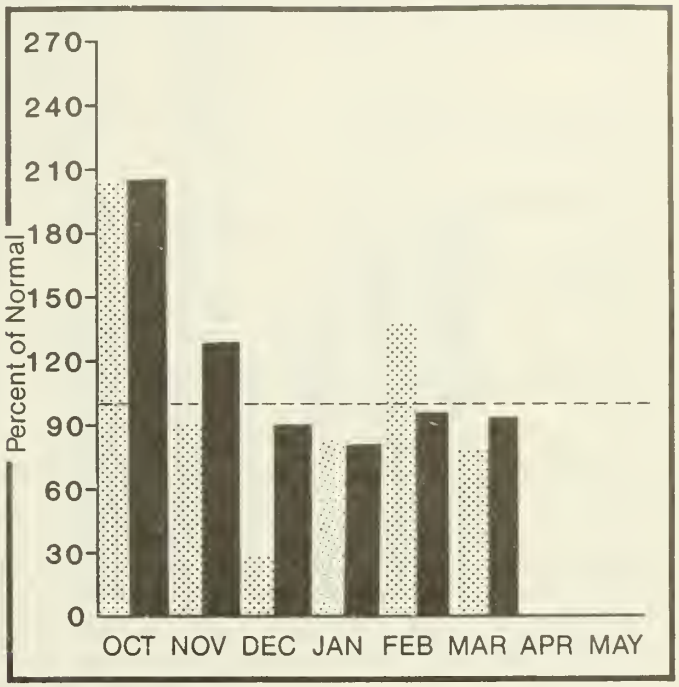
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK: Streamflows were above normal in the Yakima for March with the Yakima River at Kiona flowing 181%. Temperatures averaged four degrees above normal causing snowpack to decline to 71% of normal April 1 readings, down from the March 1 readings of 87%. Reservoir storage increased to 92% of normal for the April 1 with the five major reservoirs storing 677,400 acre feet. Forecasted streamflows for the Yakima basin are; 80% for the Yakima at Martin, 83% for the Tieton, 81% for the Naches and 76% for the Ahtanum. Precipitation for March was 75% of normal bringing the water year to 90% of average.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	112.0	80	91	71				
	APR-JUL	128.0	103.0	80	91	70				
	APR-JUN	111.0	89.0	80	90	70				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	755.0	80	90	70				
	APR-JUL	854.0	684.0	80	90	70				
	APR-JUN	734.0	587.0	79	90	70				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1660.0	79	96	62				
	APR-JUL	1898.0	1500.0	79	96	62				
	APR-JUN	1667.0	1320.0	79	96	62				
KACHESS RIVER nr Easton *	APR-SEP	121.0	97.0	80	90	70				
	APR-JUL	115.0	92.0	80	90	70				
	APR-JUN	101.0	82.0	81	91	71				
CLE ELUM RIVER nr Roslyn *	APR-SEP	463.0	380.0	82	91	73				
	APR-JUL	422.0	342.0	81	90	72				
	APR-JUN	353.0	285.0	80	90	72				
BUMPING RIVER nr Nile *	APR-SEP	142.0	118.0	83	102	64				
	APR-JUL	129.0	108.0	83	103	64				
	APR-JUN	107.0	90.0	84	103	65				
AMERICAN RIVER nr Nile	APR-SEP	124.0	103.0	83	93	73				
	APR-JUL	113.0	94.0	83	93	73				
	APR-JUN	94.0	78.0	82	93	73				
TIETON RIVER at Tieton *	APR-SEP	246.0	205.0	83	102	64				
	APR-JUL	207.0	173.0	83	102	65				
	APR-JUN	165.0	138.0	83	385	82				
NACHES RIVER nr Naches *	APR-SEP	867.0	705.0	81	101	61				
	APR-JUL	784.0	638.0	81	101	61				
	APR-JUN	667.0	540.0	80	101	61				
AHTANUM CREEK nr Tampico *	APR-SEP	47.0	36.0	76	113	40				
	APR-JUL	43.0	33.0	76	112	42				
	APR-JUN	37.0	29.0	78	114	43				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
KEECHELUS	157.8	113.3	90.3	110.0
KACHESS	239.0	159.2	163.6	187.0
CLE ELEM	436.9	243.4	191.4	299.0
BUMPING LAKE	33.7	12.6	3.8	11.0
RIMROCK	198.0	149.1	92.7	142.0

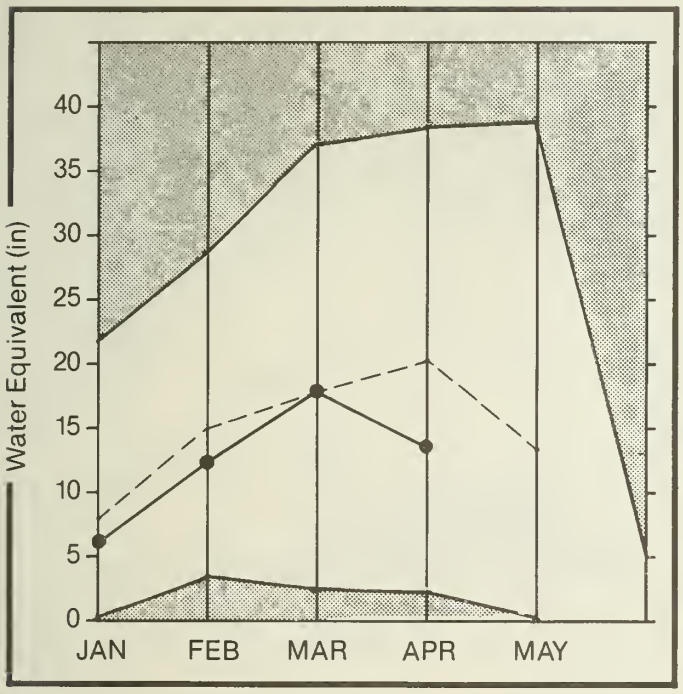
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	16	70	70
Ahtanum Creek	2	118	59

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

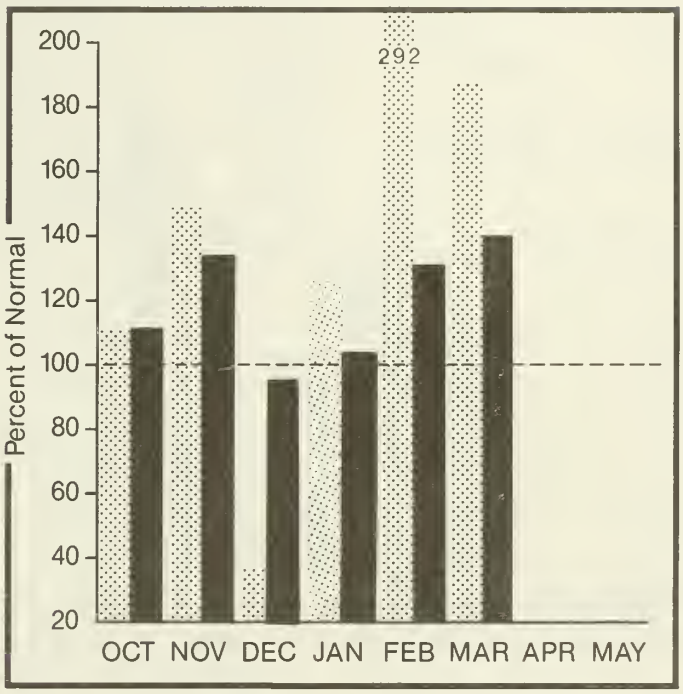
WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Precipitation for the Walla Walla station was 186% of average for March with the basin at 106% of normal. Temperatures averaged five degrees above normal for March reducing the snowpack for the basin to 66% for the April 1st readings. Streamflow for March was 163% of average for the Walla Walla River and 227% for the Snake River below Ice Harbor. Forecasted streamflows are 80% on the Walla Walla River for the summer.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK at Walla Walla	APR-SEP	17.5	14.1	80	103	63				
	APR-JUL	17.3	14.0	80	98	63				
	APR-JUN	17.1	13.8	80	99	58				
COLUMBIA R. at The Dalles *	APR-SEP	101000.0	89700.0	88	104	74				
	APR-JUL	86500.0	75700.0	87	103	73				
	APR-JUN	70100.0	62400.0	89	104	74				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

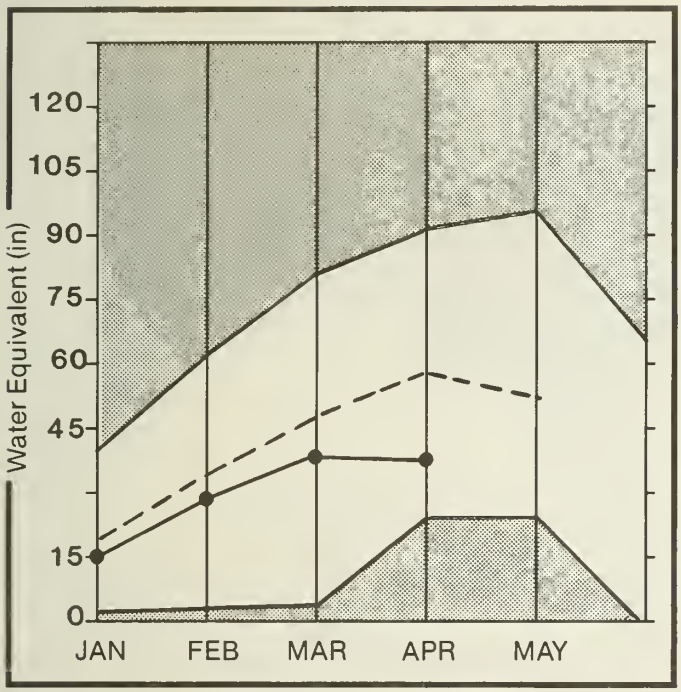
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Mill Creek	2	46	66

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

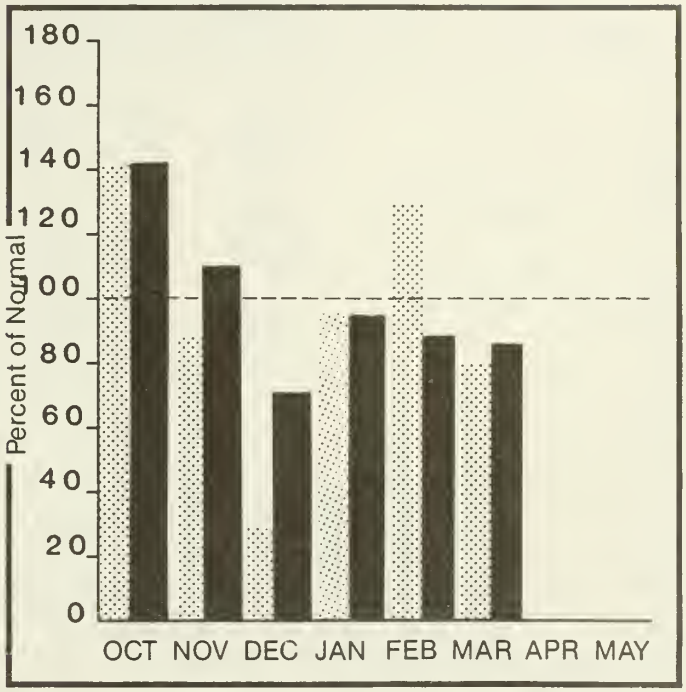
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasted streamflows on the Cowlitz River for the summer is 84% and on the Lewis River 84%. Streamflows for March were 122% of average on the Cowlitz River and 180% of normal on the Columbia River. Temperatures during March were five degrees above normal causing the snowpack to begin its spring melt nearly one month early. Snowpack was reduced to 74% of the April 1 normal. Precipitation for the Cowlitz-Lewis Basin was 79% of average for March bringing the water year to 85% of normal.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1060.0	84	112	58				
	APR-JUL	1086.0	923.0	84	112	58				
	APR-JUN	961.0	785.0	81	109	55				
COWLITZ R. bl Mayfield Dam *	APR-SEP	2038.0	1730.0	84	124	46				
	APR-JUL	1778.0	1510.0	84	124	46				
	APR-JUN	1502.0	1280.0	85	124	46				
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2270.0	84	121	49				
	APR-JUL	2323.0	1970.0	84	121	49				
	APR-JUN	1980.0	1680.0	84	121	49				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

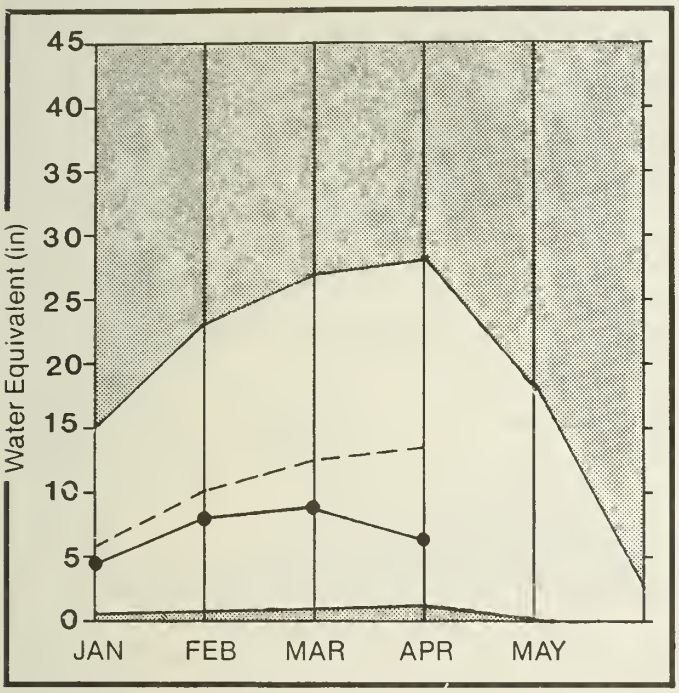
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Cowlitz River	2	67	62
Lewis River	3	61	63

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

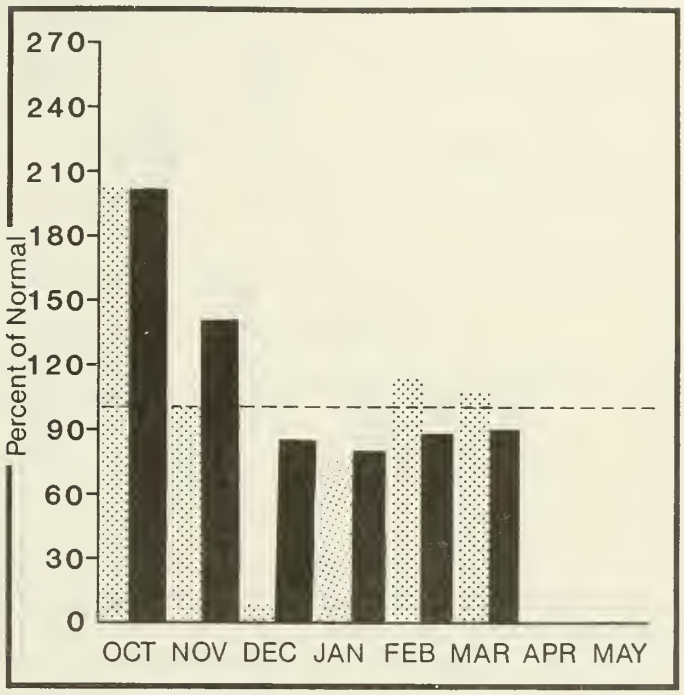
WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack continued its melt that started during February. Snow courses in the Cedar River were void of snow on the April 1 reading while the snowpack on the Green River was 45% of average and 69% on the White River. March temperatures were five degrees above average. Precipitation for the Month was 101% of normal while the water year precipitation to date is 89% of average. Streamflows are forecasted to be 70% on the Green and Cedar Rivers for the summer.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	222.0	70	70	70				
	APR-JUL	284.0	200.0	70	70	70				
	APR-JUN	256.0	180.0	70	70	70				
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	66.0	70	71	71				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

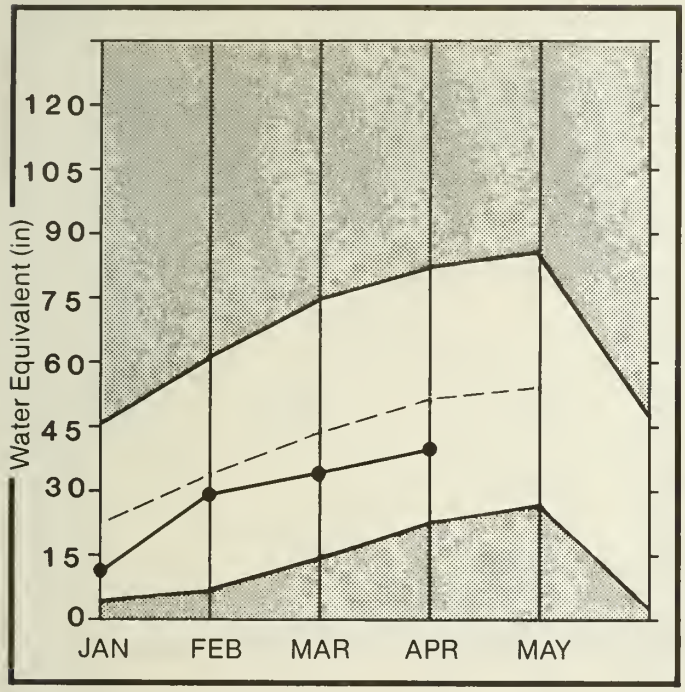
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
White River	3	74	68
Green River	10	39	45

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

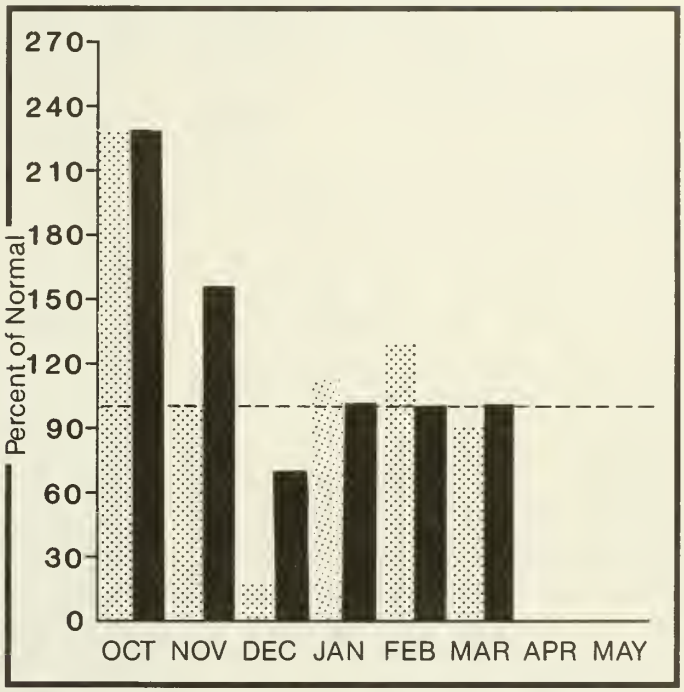
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation averaged 89% of normal for March bringing the water year to 102%. Temperatures for March were five degrees above normal. Streamflows for March were above average with the Skagit at 152% and the Skykomish at 126%. Forecasted streamflows for the summer period are for 81% on the Skagit River. Reservoir storage is good with Ross Lake at 935,500 acre feet of usable storage on April 1 or 314% of average.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	1930.0	81	98	66				
	APR-JUL	1972.0	1620.0	82	98	66				
	APR-JUN	1485.0	1220.0	82	98	66				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROSS	1404.1	935.5	468.2	298.0
DIABLO RESERVOIR	90.6	89.3	84.6	---
GORGE RESERVOIR	9.8	7.7	8.0	---

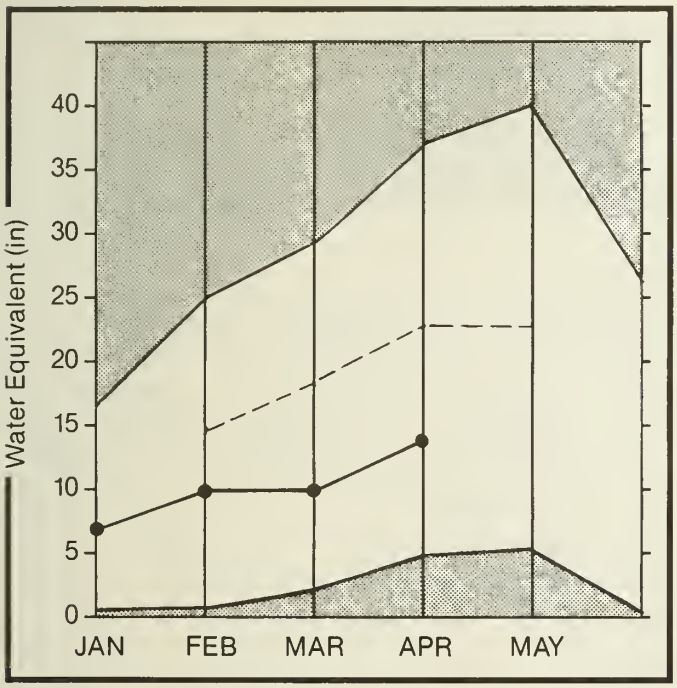
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Skagit River	14	89	75
Baker River	8	58	56
Cedar River	1	0	0
Snoqualmie River	1	49	72
Skykomish River	2	67	62

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

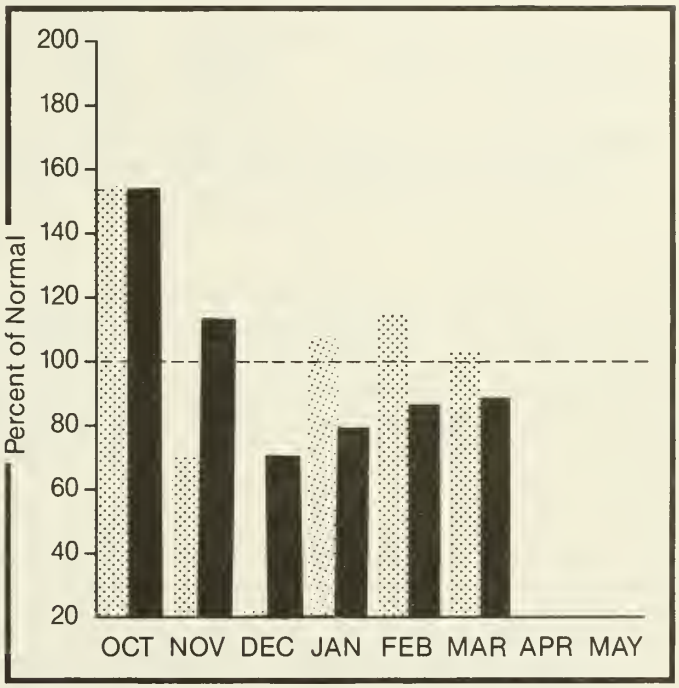
OLYMPIC

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Temperatures averaging five degrees above normal for March have reduced the April snowpack. Snowpack was 33% of normal on the Elwah and 43% on the Duwamish. Streamflows are forecasted to be near 73% for the summer. Precipitation for March was average at 102% which brings the water year to date to 88% of average.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	APR-SEP	160.0	118.0	73	90	58				
	APR-JUL	130.0	96.0	73	90	58				
	APR-JUN	97.0	72.0	74	91	58				
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	409.0	73	74	74				
	APR-JUL	454.0	336.0	74	74	74				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Dungeness River	1	46	43
Morse Creek	1	68	66
Elwha River	1	39	33

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

VOLUNTEERS NEEDED

It is no longer news that federal dollars for conservation are decreasing and that state monies must increase if we are to protect our soil and water resources for future generations.

It is news that there is now firmly in place a strong national framework for conservation volunteers.

Volunteerism in Snow Survey is not new. In Washington we have had volunteers in Wenatchee and Yakima for several years. These volunteers are capable of performing the necessary requirements for Snow Survey with and without SCS assistance.

The shock of the newly-enacted Gramm-Rudman-Hollings law that calls for stringent budget cuts to reduce the federal deficit may be with us for quite a while. Meanwhile, we are softening the law's impact by nurturing volunteerism nationwide. At no cost to conservation districts, volunteers are already providing services that their respective states might otherwise find difficult or perhaps impossible to provide.

Consider the great potential for volunteerism within America's 3,000 conservation districts. Thousands of men and women who may be of differing political persuasions are nevertheless unified in their desire to do hands-on work for soil and water conservation.

We know these people well. University students and retirees; school children and youth groups; members of farm organizations, church and civic groups. Their desire to work for conservation is real. It is stronger, perhaps, than we realize. All that we need is the organizational structure for their increased hands-on participation.

Within each of its fifty state offices and at national headquarters, the Soil Conservation Service is mobilizing a major national effort to provide opportunities for conservation volunteers. In each state, a volunteer committee is being organized to assist area and district conservationists in setting up and administering the volunteer program. At SCS national headquarters, professional staffers are assisting the states, and writers and artists are creating multi-media information aids to promote the program.

The many links, then, that create a strong structure for volunteerism - from the Nation's capitol to the states, to the counties and thousands of local communities across the continent - are forged and functioning. Moreover, there are several examples of successful volunteer programs all across the country and here in Washington State. But there is room for more volunteer participation to help us carry out our mission of protecting the soil and water resources.

If you have time and would like to volunteer, contact the local SCS office nearest you. In the yellow pages, look under U. S. Department of Agriculture - Soil Conservation Service.

Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC

Office		(509) 335-7376
Farm		(509) 335-9689

OLYMPIA, Area I

Area Office	FTS	434-9454 or 9455
Chehalis		(206) 748-0083
Kelso		(206) 425-1880
Lake Stevens	FTS	392-9259
Lynden		(206) 354-5658
Montesano		(206) 249-5900
Mt. Vernon		(206) 424-5153
Olympia FO	FTS	434-9448
Port Angeles	FTS	396-4277
Port Orchard		(206) 876-5529
Puyallup		(206) 845-5533
Raymond		(206) 942-5945
Renton	FTS	399-3325 or 3326
Vancouver	FTS	422-7631

EPHRATA, AREA II

Area Office	FTS	446-4374 or 4375
Davenport		(509) 725-4181 or 725-1345
Ephrata FO	FTS	446-4385
Moses Lake		(509) 765-3261
Okanogan		(509) 422-2750
Othello		(509) 488-2802
Ritzville		(509) 659-0254
Waterville		(509) 745-8362
Wenatchee	FTS	390-0242 or 0260

YAKIMA, AREA III

Area Office	FTS	446-5865 or 5866
Ellensburg		(509) 925-5375
Goldendale		(509) 773-5823
Pasco		(509) 545-8546 or 8547
Prosser		(509) 786-1923
Sunnyside		(509) 837-7911
Toppenish		(509) 865-4012
Walla Walla	FTS	434-6340
White Salmon		(509) 493-1936
Yakima FO	FTS	446-5909

SPOKANE, AREA IV

Area Office	FTS	439-3726
Cheney		(509) 458-6200, Ext 2309
Clarkston		(509) 758-8012
Colfax		(509) 397-4636
Colville		(509) 684-5067
Dayton		(509) 382-2351
Fairfield		(509) 283-2331
Newport		(509) 447-4217
Pomeroy		(509) 843-1998
Republic		(509) 775-3473
Spokane FO	FTS	439-2120

SOIL SURVEY OFFICES

Bellingham		(206) 676-3520
Inchelium		(509) 722-4395
Nespelem	FTS	439-9431
Wapato		(509) 877-4004

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
- Corps of Engineers

U.S. Department of Agriculture
- Forest Service

U.S. Department of Commerce
- NOAA, National Weather Service

U.S. Department of the Interior
- Bonneville Power Administration
- Bureau of Reclamation
- Geological Survey
- National Park Service

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-200D LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712

551.573
Un36wwa

Soil
Conservation
Service

Spokane,
Washington

Washington Water Supply Outlook

May 1, 1986

The Library of the
JUL 01 1986
University of Illinois
at Urbana-Champaign

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

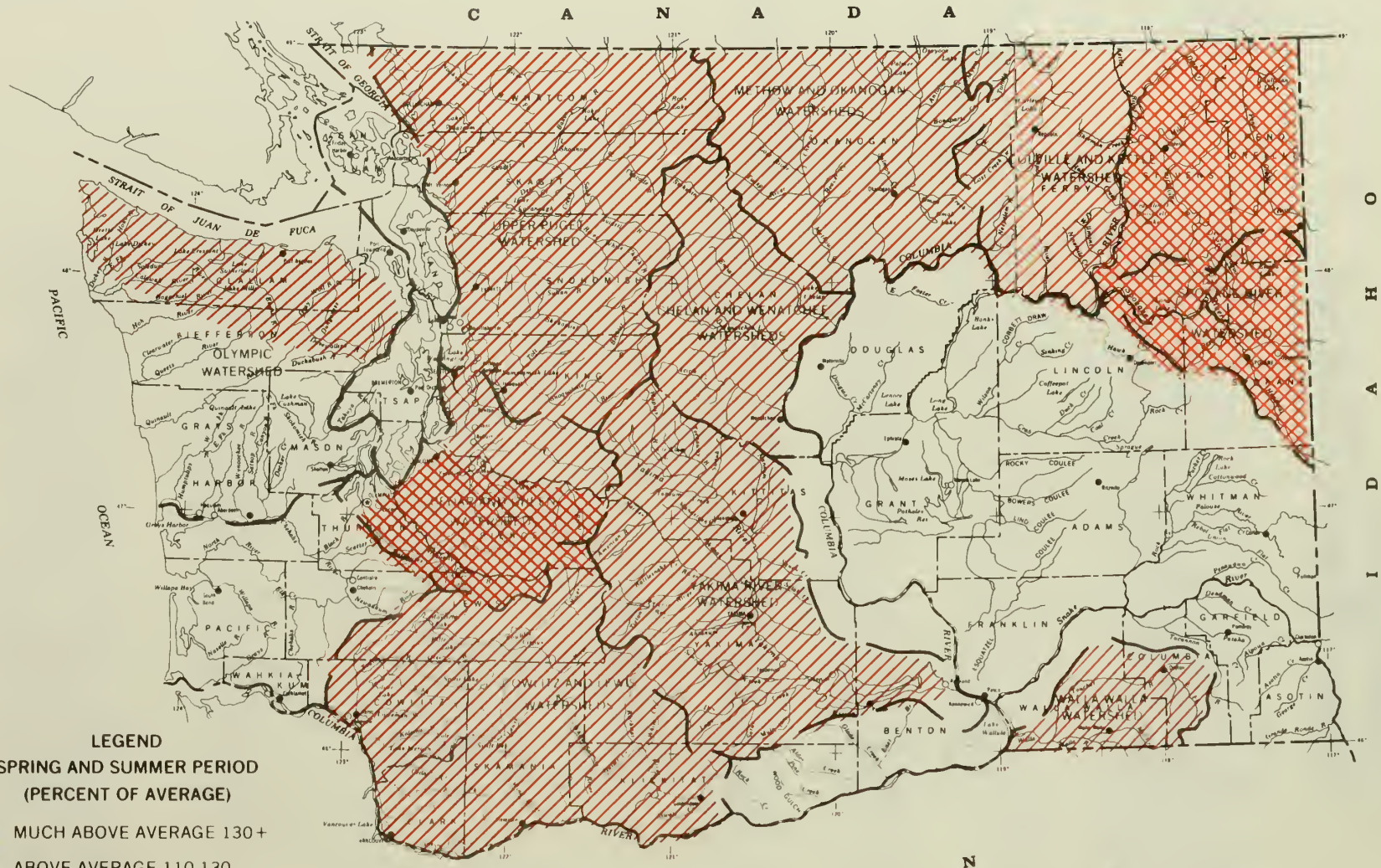
Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA are available to everyone without regard to race, creed, color, sex, age, handicap or national origin.

U S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE


C A N A D A
STRAIT OF GEORGIA
STRAIT OF JUAN DE FUCA
PACIFIC OCEAN
O R E G O N
I D A H O
METHOW AND OKANOGAN WATERSHEDS
UPPER PUGET WATERSHED
CHELAN AND WENATCHEE WATERSHEDS
COLVILLE AND KETTLE WATERSHEDS
PEND OREILLE WATERSHED
OLYMPIC WATERSHED
YAKIMA RIVER WATERSHED
WALLA WALLA WATERSHED
COLUMBIA
SNAKE
ROCKY COULEE
BOWERS COULEE
LIND COULEE
COUGAR CREEK
Pomeroy
Pataha Creek
Alpowa Creek
Asotin Creek
Lincoln Creek
Cottonwood Creek
Palouse River
Pend Oreille River
Kettle River
Okanogan River
Methow River
Wenatchee River
Yakima River
Walla Walla River
Willapa Bay
Grays Harbor
Quinault Lake
Lake Cushman
Lake Chelan
Lake Roosevelt
Banks Lake
Moses Lake
Long Lake
Coffeepot Lake
Sinking Cr
Hawk Cr
Rock Cr
Cottonwood Cr
Palouse
Pomeroy
Pataha
Alpowa
Asotin
Pullman
Colfax
Ritzville
Lewiston
Clarkston
Spokane
Cheney
Tekoa
Ephrata
Moses Lake
Wenatchee
Chelan
Leavenworth
Cashmere
Omak
Okanogan
Tonasket
Oroville
Republic
Kettle Falls
Colville
Newport
Deer Park
Mount Vernon
Sedro Woolley
Bellingham
Lynden
Ferndale
Blaine
Sumas
Everett
Snohomish
Monroe
Arlington
Stanwood
Marysville
Lake Stevens
Bremerton
Port Orchard
Shelton
Olympia
Tenino
Centralia
Chehalis
Aberdeen
Hoquiam
Ocean Shores
Raymond
South Bend
Longview
Kelso
Vancouver
Ridgefield
Goldendale
Stevenson
Cathlamet
Ilwaco
Long Beach
Seattle
Tacoma
Puyallay
Auburn
Kent
Renton
Bellevue
Redmond
Kirkland
Woodinville
Mount Rainier
Mount Adams
Mount St Helens
Mount Baker
Mount Rainier
Mount Olympus
Mount Ellinor
Mount Ellinor

GENERAL OUTLOOK

SUMMARY:

Spring continued to invade Washington State with its varied weather patterns during April. Streamflows varied from 51% of average on the Chehalis River to 188% of normal on the Similkameen River. Snowcover continued its decline with the Olympic Basin at 27% of average for April. Precipitation varied from 169% of normal for the Pend Oreille Basin to 49% on the Wenatchee-Chelan Basin. Reservoir storage for irrigation remained near average for the month. Streamflows are expected to be below normal for the summer.

SNOWPACK:

Snowcover varies from below average to much below average throughout Washington. Fewer snowcourses are read during the May 1st readings than in previous months. Five of the 34 SNOTEL sites are bare of snow. The Okanogan Basin shows the best average with 88%, while the Olympic Basin has the lowest at 27% of normal. Other basin averages are Yakima 62%, Wenatchee 58%, Skagit 70%, Cowlitz 57%, and the Pend Oreille 60%. Maximum snowpack occurred at the Paradise SNOTEL where 59 inches of snow water were measured.

PRECIPITATION:

April moisture was much above average for the Colville-Pend Oreille Basin at 169%. The Wenatchee Basin was the lowest at 49% of normal. Other basins with near normal precipitation for April are the Spokane at 101%, Cowlitz 100% and the Green River at 93%. Those with below average precipitation include the Yakima at 79%, Walla Walla at 88% and the Okanogan at 74%. Most of the precipitation was in the form of rain and only minor amounts of snowfall were reported from the SNOTEL sites.

RESERVOIRS:

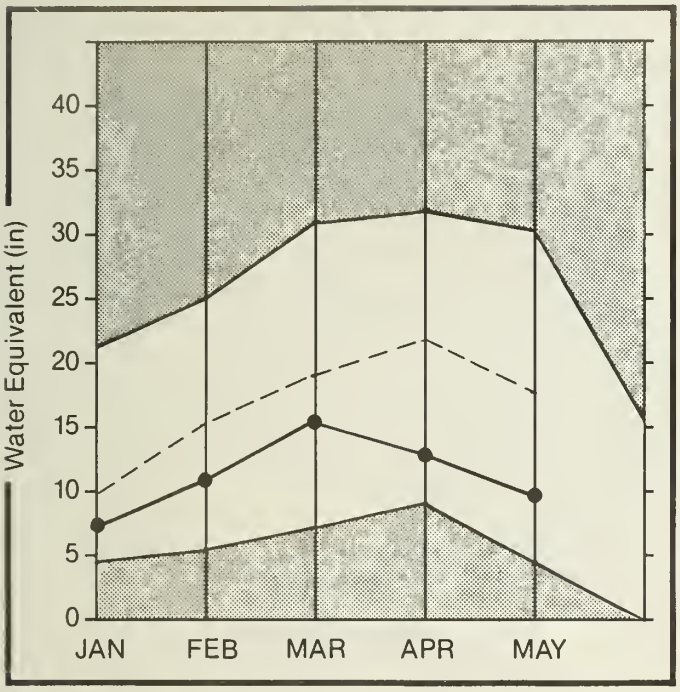
Irrigation reservoirs are at 102% of May 1 average storage. The Yakima reservoirs are storing 796,000 acre feet or 75% of capacity. The Okanogan reservoirs are storing 16,700 acre feet which is 71% of capacity. Roosevelt Lake is at 2,700,700 acre feet or 51% of capacity. Lake Chelan is at 85% of May 1 normal and 57% of capacity. Ross reservoir is at 141% of May 1 normal and 65% of capacity.

STREAMFLOW:

April streamflow varied widely over Washington with the Similkameen River continuing high at 188% of normal and the Chehalis River the low at 51% of average. Most westside streams were low with the Skagit at 87%, the Skykomish at 75% and the Cowlitz River at 68%. The Wenatchee River continued above average at 124% as did the Chelan at 124%, the Kettle River 135% and the Pend Oreille River at 119%. The Yakima River was at 89% and the Spokane River was 82% of normal for April. Streamflow is forecast to be below average to much below average over all of Washington.

SPOKANE

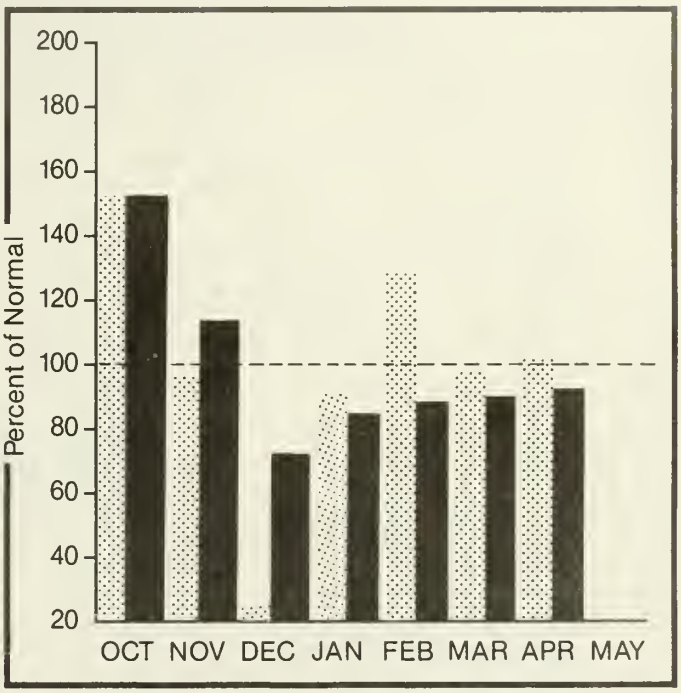
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Snowcover continued to decline during April, going from 58% of normal on April 1 to 56% on May 1. April precipitation was average at 101%, with most of it in the form of rain. April streamflow was 82% of normal. Forecasted streamflow is 51% of average. Storage in Coeur d' Alene Lake is 153,600 acre feet or 68% of normal for May 1.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	MAY-SEP	1977.0	1010.0	51	73	29				
	MAY-JUL	1884.0	956.0	50	73	29				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.
COEUR D'ALENE	225.1	153.6	214.0	275.1

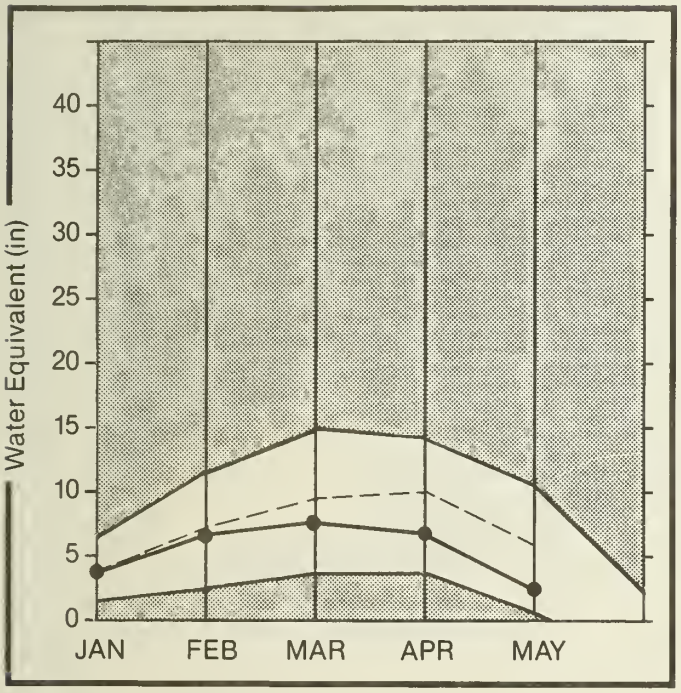
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Spokane River	8	47	50

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

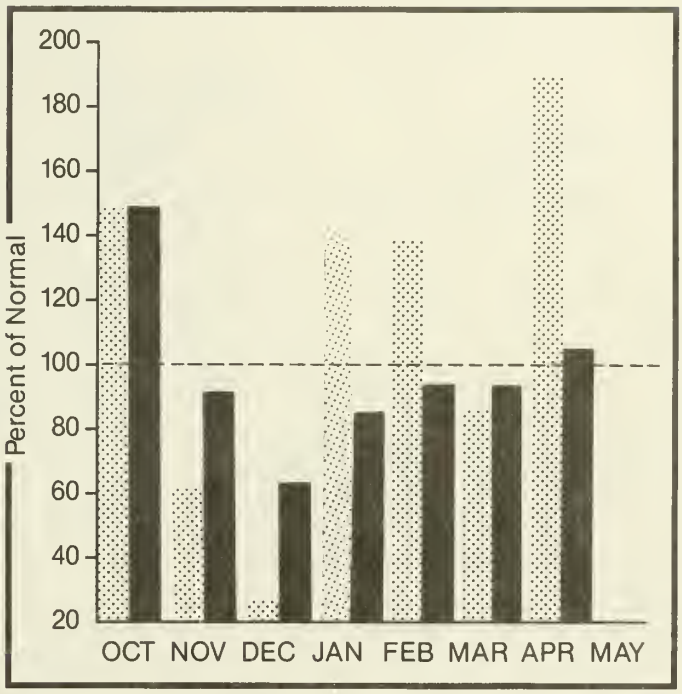
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowmelt continued in the Colville-Pend Oreille Basin with streamflow at 119% of April normal. Streamflow on the Kettle River was also high at 135% of average. Precipitation was 169% of normal for April with 3.22 inches recorded at the Colville airport. The water year to date precipitation has been 100% of average. Snowcover was 60% of average. Forecasted streamflows are Kettle 80%, Pend Oreille 62% and 63% on the Colvile. Storage in Roosevelt is 197% of average at 2,700,700 acre feet.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	MAY-SEP	13316.0	8640.0	64	85	45				
	MAY-JUL	12047.0	7700.0	63	84	44				
	MAY-JUN	10119.0	6480.0	64	84	44				
CHAMOKANE CREEK	JUL-AUG	3.6	2.9	80	111	28				
COLVILLE RIVER at Kettle Falls	MAY-SEP	85.1	52.8	62	99	23				
	MAY-JUL	74.3	46.8	62	100	26				
	MAY-JUN	66.0	41.6	63	100	26				
KETTLE RIVER nr Laurier	MAY-SEP	1581.0	1260.0	79	98	62				
	MAY-JUL	1491.0	1180.0	79	97	61				
	MAY-JUN	1334.0	1050.0	78	97	61				
COLUMBIA RIVER at Birchbank *	MAY-SEP	41733.0	41900.0	100	113	87				
	MAY-JUL	32833.0	32900.0	100	113	87				
	MAY-JUN	23155.0	23200.0	100	113	87				
COLUMBIA RIVER at Grand Coulee *	MAY-SEP	60100.0	54800.0	91	102	80				
	MAY-JUL	49400.0	44500.0	90	101	79				
	MAY-JUN	37300.0	33600.0	90	101	79				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROOSEVELT	5232.0	2700.7	947.3	1310.0
BANKS	715.0	661.5	645.4	435.0

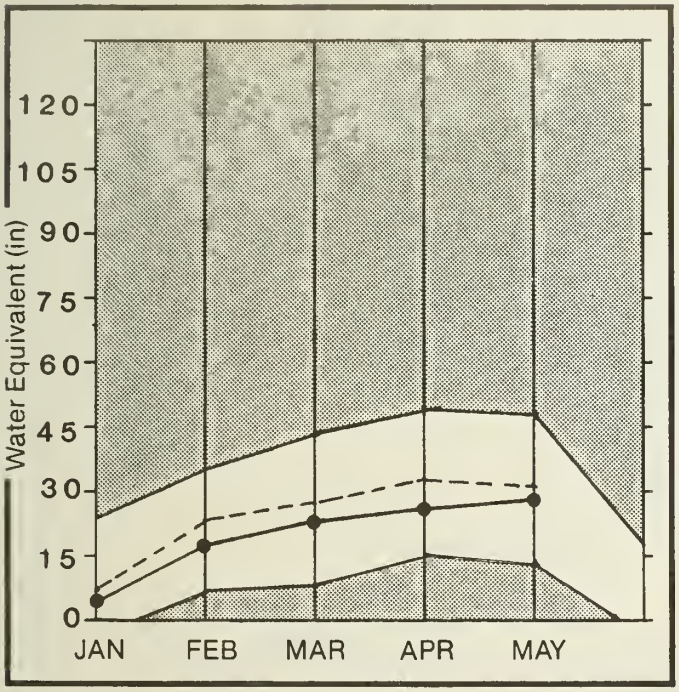
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	0	0	0
Pend Oreille River	10	64	61
Kettle River	2	83	67
Omac Lake, Twin Lakes	0	0	0
Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

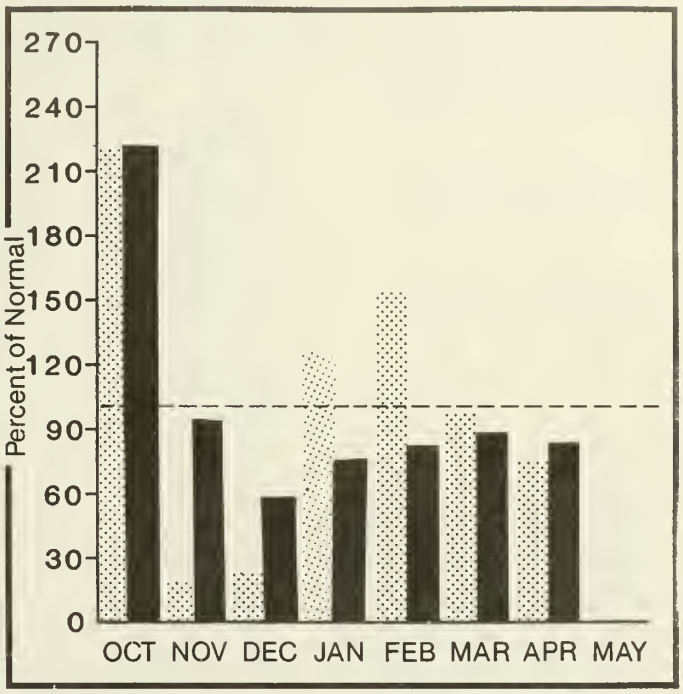
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflow remained high in the Okanogan with the Similkameen River at 188% of normal and the Okanogan River at 146%. All Low elevation snow is now gone with the Salmon Meadows SNOTEL site bare. Snowcover in the upper basin is at 88% of April normal. Precipitation was 74% of average for April, for a water year total of 86%. Storage in the Conconully reservoirs is normal at 16,700 acre feet. Forecasted streamflows are Okanogan River 75%, Methow River 80% and the Similkameen River 75%.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	MAY-SEP	1376.0	1040.0	75	104	48				
	MAY-JUL	1279.0	959.0	74	103	47				
	MAY-JUN	1075.0	806.0	74	103	47				
OKANOGAN R. nr Tonasket	MAY-SEP	1517.0	1150.0	75	105	47				
	MAY-JUL	1370.0	1030.0	75	104	46				
	MAY-JUN	1135.0	851.0	74	104	46				
METHOW RIVER nr Pateros	MAY-SEP	900.0	728.0	80	105	57				
	MAY-JUL	828.0	660.0	79	104	56				
	MAY-JUN	693.0	554.0	79	104	56				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CONCONULLY LAKE (SALMON)	10.5	8.6	9.8	8.0
CONCONULLY RESERVOIR	13.0	8.1	13.0	8.0

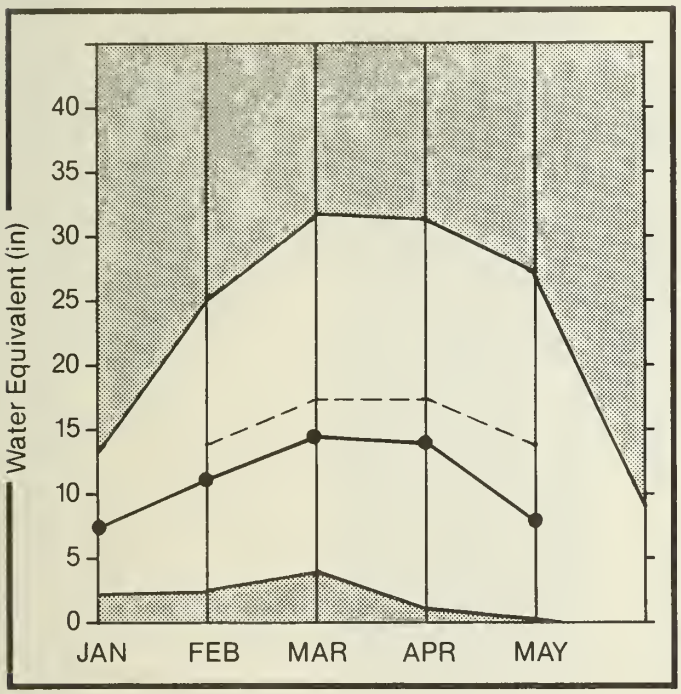
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Okanogan River	24	112	93
Methow River	4	112	79

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

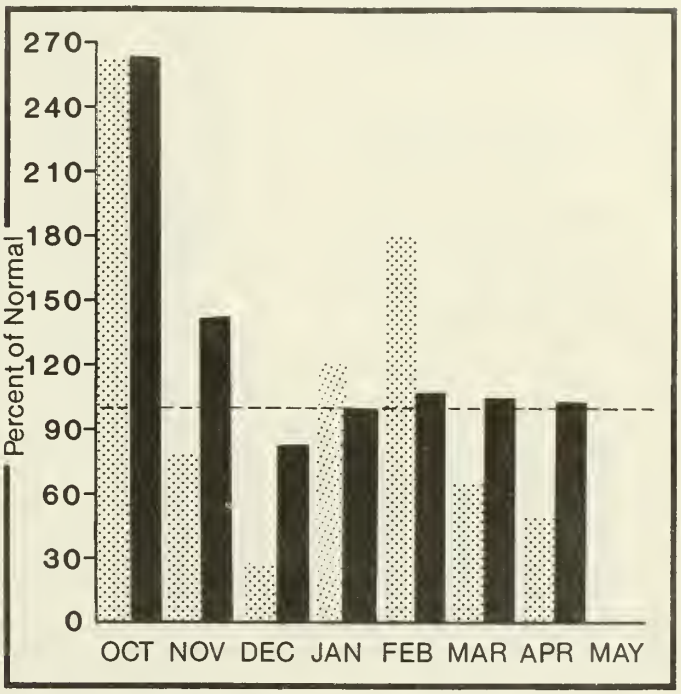
WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation for April was 49% of normal bringing the water year total to 101% of normal. Storage in Chelan Lake is 382,800 acre reet or 85% of May 1 normal. Snowcover is 84% of May 1 average with Lyman Lake SNOTEL reporting 52 inches of snow water on May 1. April streamflow was 129% for the Chelan and 124% on the Wenatchee River. Forecasted streamflows are 75% on the Wenatchee, 79% on the Entiat and 79% on the Chelan River.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	MAY-SEP	1094.0	864.0	78	94	64				
	MAY-JUL	946.0	747.0	78	94	64				
	MAY-JUN	717.0	570.0	79	95	64				
STEHEKIN R. at Stehekin	MAY-SEP	860.0	694.0	80	91	71				
	MAY-JUL	727.0	592.0	81	91	71				
	MAY-JUN	553.0	447.0	80	91	71				
ENTIAT RIVER nr Ardenvoir	MAY-SEP	218.0	172.0	78	94	64				
	MAY-JUL	197.0	156.0	79	94	64				
	MAY-JUN	155.8	124.0	79	94	65				
WENATCHEE RIVER at Plain	MAY-SEP	1136.0	852.0	75	108	42				
	MAY-JUL	1002.0	752.0	75	108	42				
	MAY-JUN	765.0	581.0	75	109	43				
WENATCHEE R. at Peshastin	MAY-SEP	1523.0	1160.0	76	109	43				
	MAY-JUL	1356.0	1030.0	75	109	43				
	MAY-JUN	1048.0	807.0	77	110	44				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	102.0	73	107	41				
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	278.0	75	108	42				
	APR-JUL	340.0	260.0	76	109	44				
	APR-JUN	270.0	205.0	75	109	43				
COLUMBIA R. bl Rock Island Dam *	MAY-SEP	65550.0	59800.0	91	102	80				
	MAY-JUL	54375.0	48900.0	89	101	79				
	MAY-JUN	41160.0	37100.0	90	101	79				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CHELAN LAKE	676.1	382.8	202.8	448.8

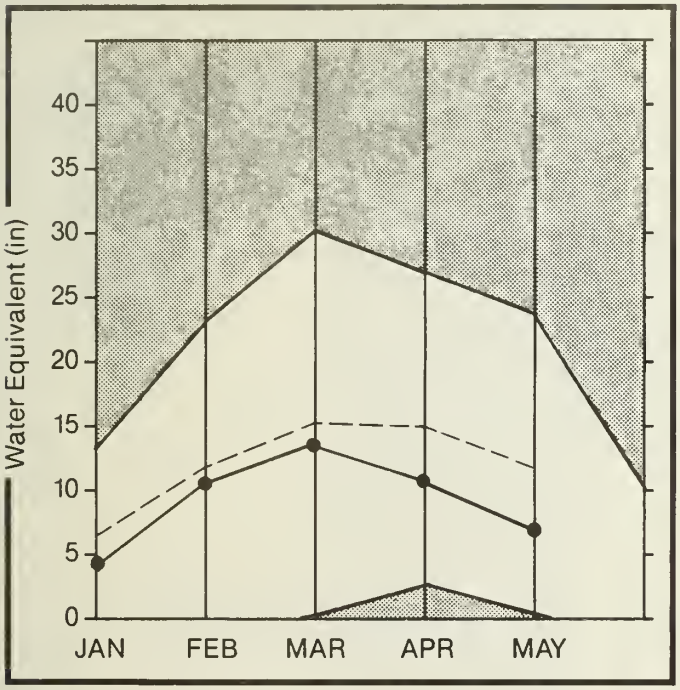
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	4	103	98
Entiat River	0	0	0
Wenatchee River	5	78	56
Colockum Creek	1	0	4
Squilchuck Creek	0	0	0
Stemilt Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

Mountain snowpack* (inches)



*Based on selected stations

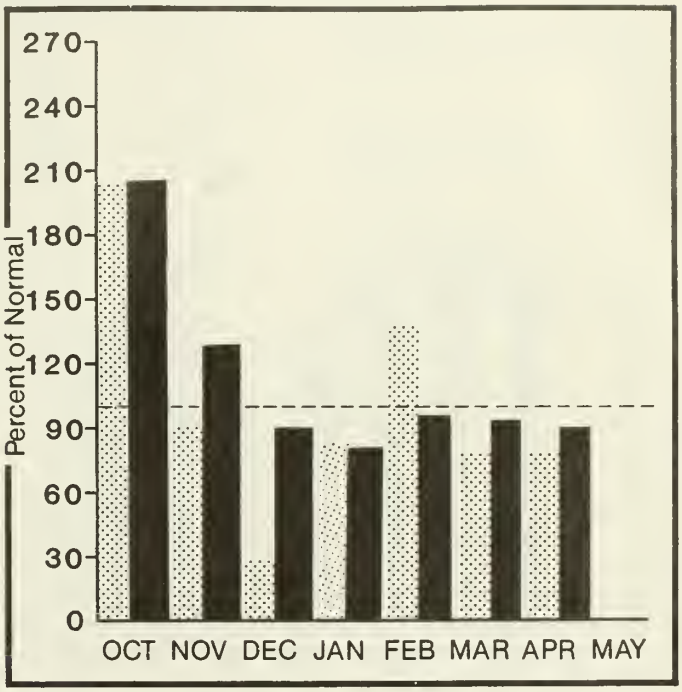
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Reservoir storage remains good with the Yakima reservoirs storing 796,000 acre feet or 102% of May 1 average. Streamflow was low during April with 89% of normal. Temperatures averaging 2 degrees below normal and precipitation 79% of April normal contributed to the lower flows. Snowcover continued to decline with the May 1 readings being 61% of average. Summer streamflows are forecast to be; Yakima River near Parker 75%, Naches River 75%, Ahtanum Creek 70%, and the Tieton River 73%.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	MAY-SEP	114.0	86.0	75	88	63				
	MAY-JUL	103.0	77.0	74	86	63				
	MAY-JUN	86.0	66.0	76	88	65				
YAKIMA RIVER at Cle Elum *	MAY-SEP	780.0	592.0	75	89	63				
	MAY-JUL	693.0	527.0	76	89	63				
	MAY-JUN	574.0	436.0	75	89	63				
YAKIMA RIVER nr Parker *	MAY-SEP	1711.0	1160.0	67	87	49				
	MAY-JUL	1510.0	1030.0	68	87	49				
	MAY-JUN	1274.0	866.0	67	87	49				
KACHESS RIVER nr Easton *	MAY-SEP	98.0	73.0	74	89	60				
	MAY-JUL	92.0	70.0	76	90	62				
	MAY-JUN	78.0	58.0	74	88	60				
CLE ELUM RIVER nr Roslyn *	MAY-SEP	400.0	280.0	70	82	58				
	MAY-JUL	360.0	252.0	70	82	58				
	MAY-JUN	291.0	203.0	69	82	58				
BUMPING RIVER nr Nile *	MAY-SEP	126.0	100.0	79	94	64				
	MAY-JUL	114.0	90.0	78	94	64				
	MAY-JUN	91.0	72.0	79	95	64				
AMERICAN RIVER nr Nile	MAY-SEP	114.0	85.0	74	87	62				
	MAY-JUL	103.0	76.0	73	85	62				
	MAY-JUN	82.0	61.0	74	87	62				
TIETON RIVER at Tieton *	MAY-SEP	214.0	158.0	73	90	58				
	MAY-JUL	175.0	129.0	73	90	58				
	MAY-JUN	133.0	98.0	73	89	58				
NACHES RIVER nr Naches *	MAY-SEP	728.0	547.0	75	89	61				
	MAY-JUL	645.0	480.0	74	88	60				
	MAY-JUN	530.0	395.0	74	88	61				
AHTANUM CREEK nr Tampico *	MAY-SEP	39.0	27.3	70	92	49				
	MAY-JUL	35.0	24.7	70	91	49				
	MAY-JUN	29.0	20.3	70	93	48				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
KEECHELUS	157.8	130.4	126.9	119.0
KACHESS	239.0	181.7	200.7	197.0
CLE ELEM	436.9	299.6	258.5	308.0
BUMPING LAKE	33.7	15.7	17.2	15.0
RIMROCK	198.0	168.6	115.3	144.0

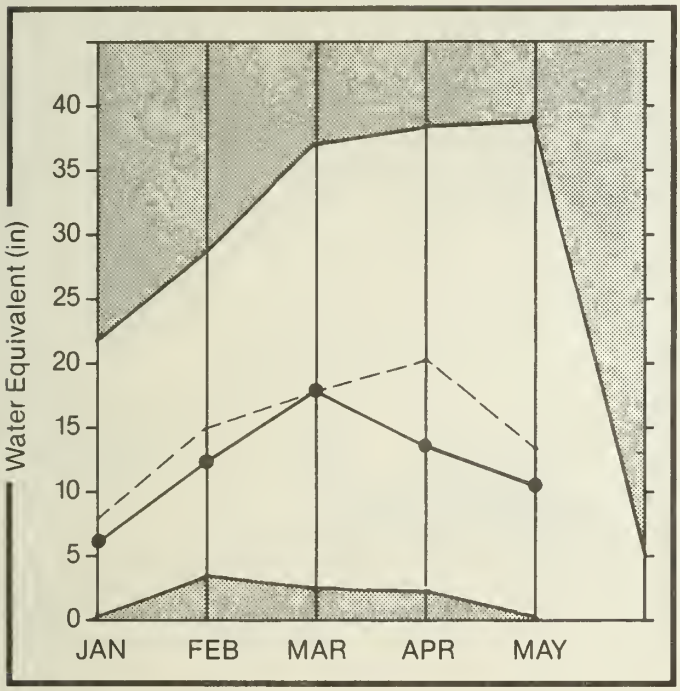
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	11	65	63
Ahtanum Creek	1	143	62

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

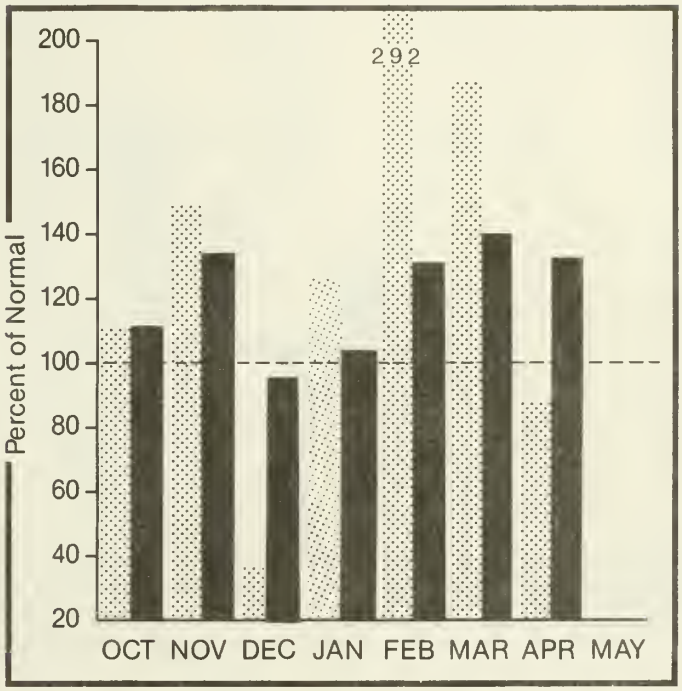
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Streamflows dropped below normal for April at 85%. Normal temperatures and below average precipitation of 88% caused the lower flows. The snowpack has melted at the lower elevations. The water content at the Touchet SNOTEL site is 68% of normal May 1 readings. The total precipitation for the water year to date is 99% of average. Forecasted streamflow for the Walla Walla River is 70%.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK NEAR WALLA WALLA	MAY-SEP	7.7	5.7	74	117	39				
	MAY-JUN	7.3	5.3	72	110	41				
	MAY-JUL	7.5	5.4	72	107	40				
COLUMBIA R. at The Dalles *	MAY-SEP	88290.0	77800.0	88	101	75				
	MAY-JUL	73760.0	62800.0	85	98	72				
	MAY-JUN	57360.0	48800.0	85	98	72				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

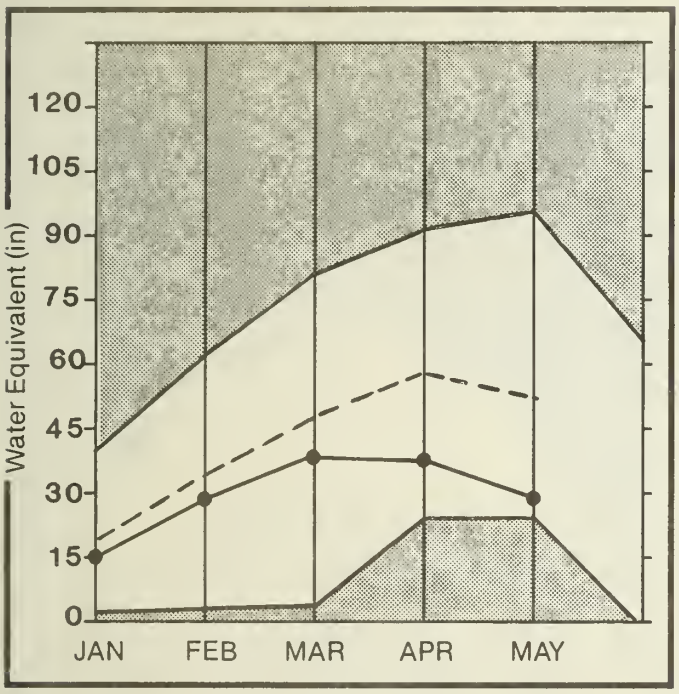
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Mill Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

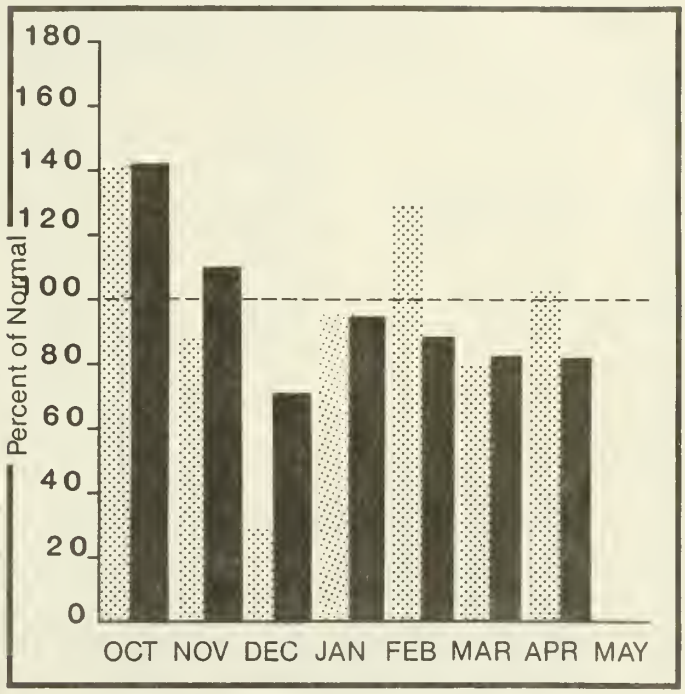
COWLITZ AND LEWIS

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflows are forecast to be 80% on the Cowlitz and 87% on the Lewis River for the summer. Snowcover is at 57% of May 1 normal. April precipitation was 100 of average keeping the year to date precipitation at 87% of normal. April streamflow on the Cowlitz River was 68% of average. Maximum snowpack on Mt. St. Helens was at the Plains of Abraham SNOTEL where 48 inches of snow water remained on the pillows for the May 1 readings.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	MAY-SEP	900.0	791.0	87	112	64				
	MAY-JUL	737.0	648.0	87	112	64				
	MAY-JUN	612.0	538.0	87	112	64				
COWLITZ R. bl Mayfield Dam *	MAY-SEP	1617.0	1290.0	79	129	31				
	MAY-JUL	1357.0	1090.0	80	129	31				
	MAY-JUN	1081.0	865.0	80	129	31				
COWLITZ R. at Castle Rock *	MAY-SEP	2058.0	1650.0	80	129	31				
	MAY-JUL	1708.0	1370.0	80	129	31				
	MAY-JUN	1365.0	1090.0	79	129	31				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

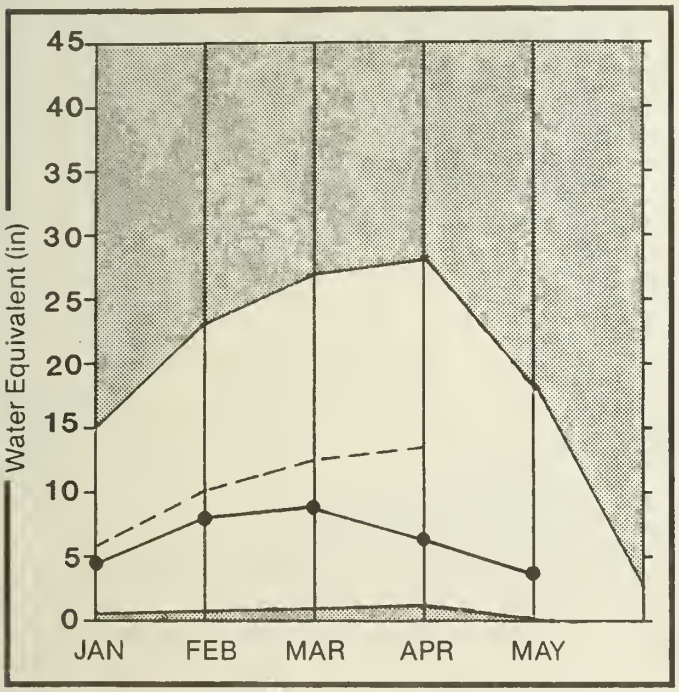
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Cowlitz River	1	78	67
Lewis River	3	79	68

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WHITE - GREEN

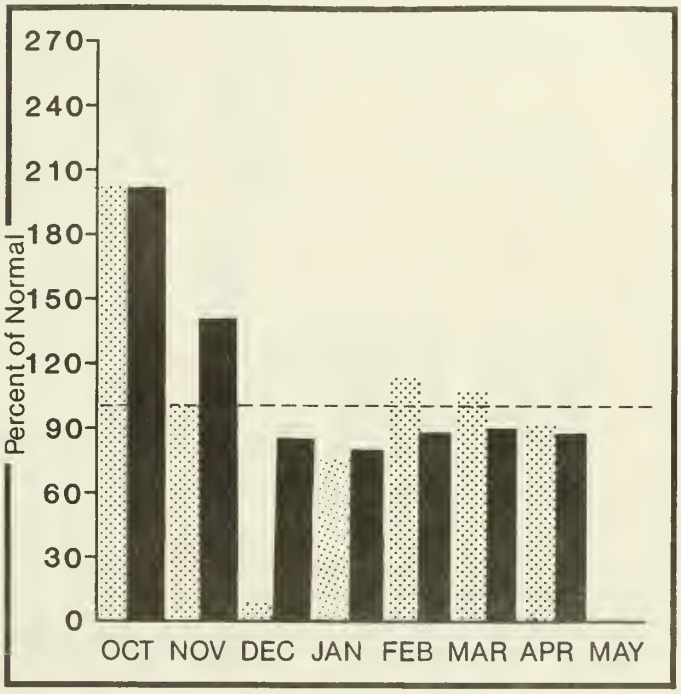
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack showed some minor improvement with 70% of May 1 normal on the White and 64% on the Green. Streamflow remained low with near normal temperatures and 93% of average April precipitation. The water year to date precipitation is at 89% of average. Streamflows are forecast to be 64% on the Green River and 70% on the Cedar River for the summer.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	MAY-SEP	316.0	205.0	64	82	48				
	MAY-JUL	284.0	185.0	65	82	48				
	MAY-JUN	256.0	175.0	68	68	68				
CEDAR RIVER nr Cedar Falls	MAY-SEP	74.2	52.0	70	88	53				
	MAY-JUL	65.5	46.5	70	89	53				
	MAY-JUN	54.1	38.0	70	87	54				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

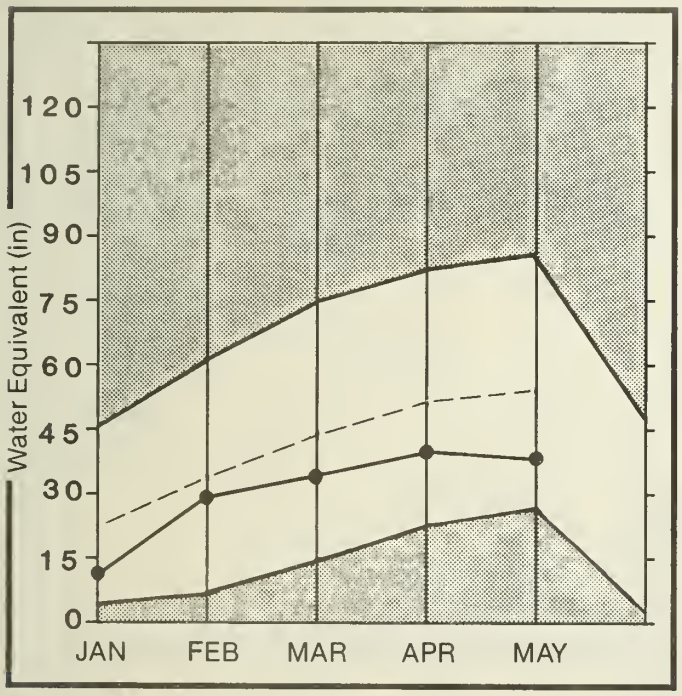
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
White River	1	95	70
Green River	6	36	64

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

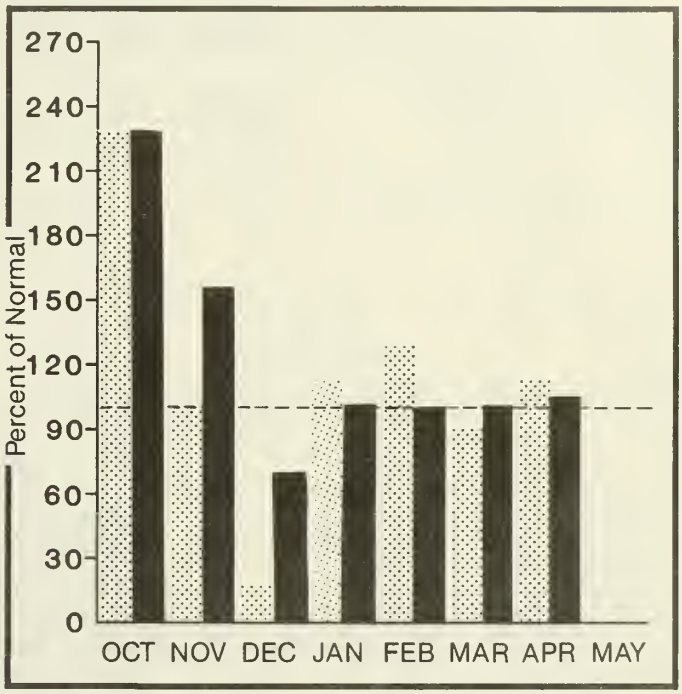
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation averaged 119% of normal for April bringing the water year to 104% of normal as of May 1. Streamflow in the Skagit River was 87% of average for April. Snowcover in the Basin was 70% of the May 1 average. Forecasted streamflows are for 75% of normal for the summer months. Reservor storage in Ross Lake is 65% of capacity and 141% of the May 1 average.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	MAY-AUG	2532.0	1900.0	75	90	60				
	MAY-SEP	2356.0	1767.0	75	90	60				
	MAY-JUL	1972.0	1479.0	75	90	60				
	MAY-JUN	1485.0	1157.0	77	93	63				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROSS	1404.1	911.8	607.3	644.4
DIABLO RESERVOIR	90.6	86.1	86.0	---
GORGE RESERVOIR	9.8	7.8	7.8	---

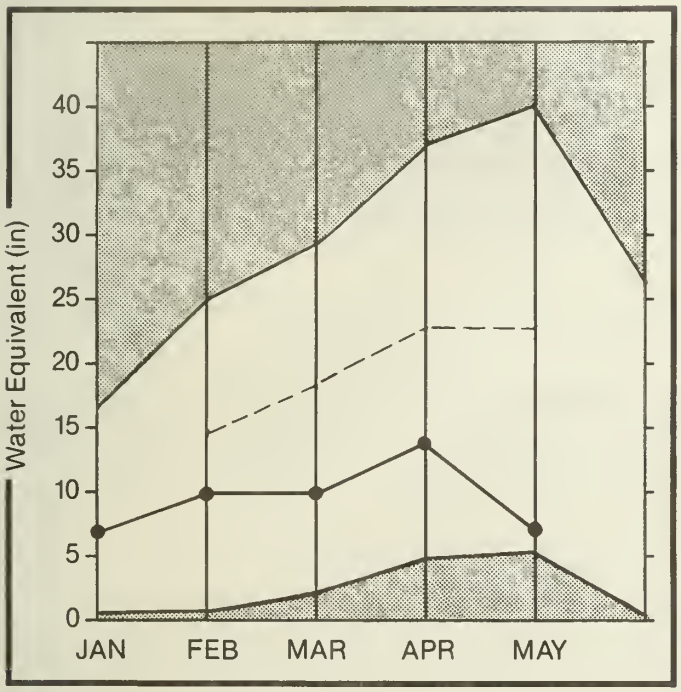
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Skagit River	13	89	69
Baker River	9	60	64
Cedar River	0	0	0
Snoqualmie River	1	52	72
Skykomish River	2	68	50

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

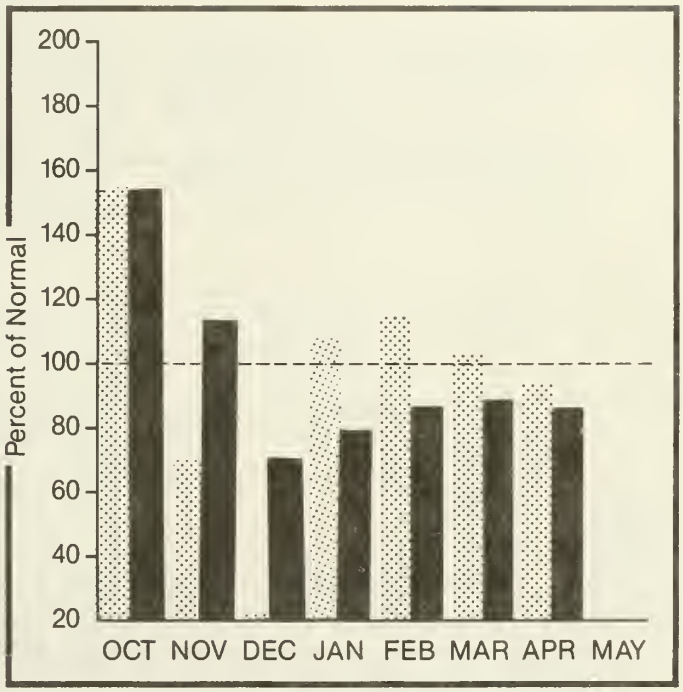
OLYMPIC

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Much below averge streamflows are forecast for the Olympic Basin for the coming summer. Forecasts for Duwamish, Elwah and for Morse Creek are 70%. Precipitation for April was 87% of average with the water year totals to May 1 at 88%. Snowcover is very low with the basin average at 27% for May 1.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	MAY-SEP	160.0	112.0	70	87	53				
	MAY-JUL	130.0	91.0	70	87	53				
	MAY-JUN	97.0	68.0	70	87	54				
ELWHA RIVER nr Port Angeles	MAY-SEP	553.0	387.0	69	87	53				
	MAY-JUL	454.0	320.0	70	87	54				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	ND. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Dungeness River	1	50	36
Morse Creek	1	69	60
Elwha River	1	29	19

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

IMPORTANT NOTICE

WATER SUPPLY OUTLOOK FOR WASHINGTON

(DETACH HERE)

If you wish to continue to receive this publication, detach this page, sign your name in the space below, fold on the heavy line, staple or tape the folded page and mail. If more than one copy of the publication is desired, place the number in the box by your signature.

☐ Signed: _____

Suggestions, comments or remarks: _____

_____

_____

Print or type your name and address on back of this sheet, if it is not there already

(FOLD HERE)

UNITED STATES
DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
360 U.S. COURTHOUSE
SPOKANE, WASHINGTON 99201

PLACE
STAMP
HERE

SNOW SURVEY SUPERVISOR
SOIL CONSERVATION SERVICE
360 U.S. COURTHOUSE
SPOKANE, WASHINGTON 99201

(STAPLE OR TAPE HERE)

☆ GPO 1983 696-712

Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC

Office		(509) 335-7376
Farm		(509) 335-9689

OLYMPIA, Area I

Area Office	FTS	434-9454 or 9455
Chehalis		(206) 748-0083
Kelso		(206) 425-1880
Lake Stevens	FTS	392-9259
Lynden		(206) 354-5658
Montesano		(206) 249-5900
Mt. Vernon		(206) 424-5153
Olympia FO	FTS	434-9448
Port Angeles	FTS	396-4277
Port Orchard		(206) 876-5529
Puyallup		(206) 845-5533
Raymond		(206) 942-5945
Renton	FTS	399-3325 or 3326
Vancouver	FTS	422-7631

EPHRATA, AREA II

Area Office	FTS	446-4374 or 4375
Davenport		(509) 725-4181 or 725-1345
Ephrata FO	FTS	446-4385
Moses Lake		(509) 765-3261
Okanogan		(509) 422-2750
Othello		(509) 488-2802
Ritzville		(509) 659-0254
Waterville		(509) 745-8362
Wenatchee	FTS	390-0242 or 0260

YAKIMA, AREA III

Area Office	FTS	446-5865 or 5866
Ellensburg		(509) 925-5375
Goldendale		(509) 773-5823
Pasco		(509) 545-8546 or 8547
Prosser		(509) 786-1923
Sunnyside		(509) 837-7911
Toppenish		(509) 865-4012
Walla Walla	FTS	434-6340
White Salmon		(509) 493-1936
Yakima FO	FTS	446-5909

SPOKANE, AREA IV

Area Office	FTS	439-3726
Cheney		(509) 458-6200, Ext 2309
Clarkston		(509) 758-8012
Colfax		(509) 397-4636
Colville		(509) 684-5067
Dayton		(509) 382-2351
Fairfield		(509) 283-2331
Newport		(509) 447-4217
Pomeroy		(509) 843-1998
Republic		(509) 775-3473
Spokane FO	FTS	439-2120

SOIL SURVEY OFFICES

Bellingham		(206) 676-3520
Inchelium		(509) 722-4395
Nespelem	FTS	439-9431
Wapato		(509) 877-4004

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
- Corps of Engineers

U.S. Department of Agriculture
- Forest Service

U.S. Department of Commerce
- NOAA, National Weather Service

U.S. Department of the Interior
- Bonneville Power Administration
- Bureau of Reclamation
- Geological Survey
- National Park Service
- Bureau of Indian Affairs

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-2000 LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712

551.573
Un36wwa

Soil
Conservation
Service

Spokane,
Washington

Washington Water Supply Outlook

JUNE 1, 1986

The Library of the
JUL 28 1986
University of Illinois
at Urbana-Champaign

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

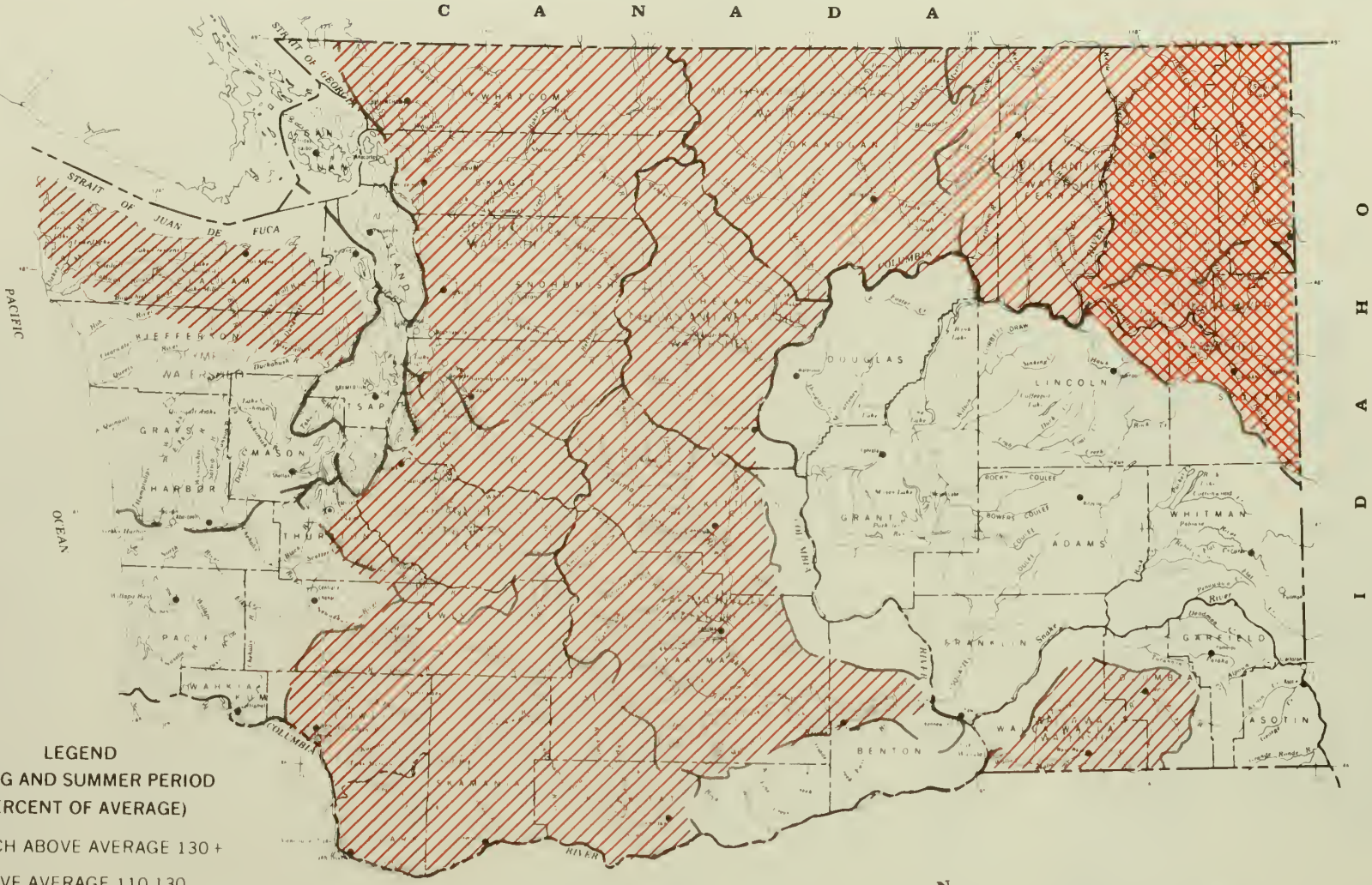
Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA are available to everyone without regard to race, creed, color, sex, age, handicap or national origin.

U S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



LEGEND
SPRING AND SUMMER PERIOD
(PERCENT OF AVERAGE)

- MUCH ABOVE AVERAGE 130 +
- ABOVE AVERAGE 110 130
- NEAR AVERAGE 90 110
- BELOW AVERAGE 70 90
- MUCH BELOW AVERAGE 70 + LESS
- NOT FORECAST
- WATERSHED BOUNDARY

JUNE 1, 1986

STREAMFLOW PROSPECTS WASHINGTON

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Data compiled by SCS Field Personnel.

JANUARY 1986 4 R 39641

BASE 4 R 39260

GENERAL OUTLOOK

SUMMARY:

THIS IS THE FINAL WATER SUPPLY OUTLOOK REPORT OF THE SEASON, NEXT REPORT JANUARY 1987. With only a few manual snow courses read the 1st of June the SNOTEL sites give most of our snow information. Sixteen ofthe 34 sites were bare of snow on June 1. Paradise with 51 inches of water content had the most snow. Reservoir storage continues to be near normal. Precipitation was good over most of the state. Temperatures were below normal during the early part of May then above average for the last week.

SNOWPACK:

Above average temperatures for the last week in May accelerated the melt of the snow pack. Snow has melted from 16 of the 34 SNOTEL sites in Washington compared to last year when 20 sites were bare. There were 19 manual snow courses read this month with this small amount of courses few conclusions can be drawn.

PRECIPITATION:

The month of May had varied precipitation over Washington. The west and southeast were above normal while the eastern and central part were below normal. The Olympic Basin was at 209% of average with the north Puget Sound at 160%. The Okanogan area had 35% of normal precipitation while the Colville-Pend Oreille had 68%. The Yakima Basin was at 186% of average.

RESERVOIRS:

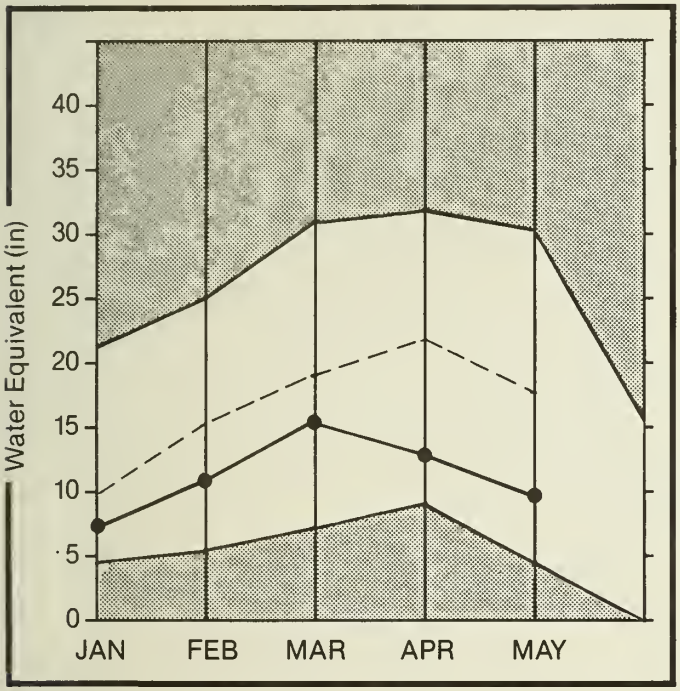
Stored irrigation water supplies are near average for June 1. The Yakima Basin has 937,600 acre-feet in the five major reservoirs which is average for June 1. Chelan Lake is at 133% of normal; Coeur d' Alene Lake is at 96%, and the Okanogan storage is at 99%. FDR lake is at 121% of average and the north Puget storage is at 112%.

STREAMFLOW:

Streamflow was near average in Washington rivers during May. The Chehalis River with 157% of average was the highest while the Spokane River with 55% was the lowest. Some flooding was experienced along the Okanogan River during the last of May; flooding was contained in the lowlands with only minor damages to homes. Streamflows were high during the last week of May as the warm weather melted the remaining snow.

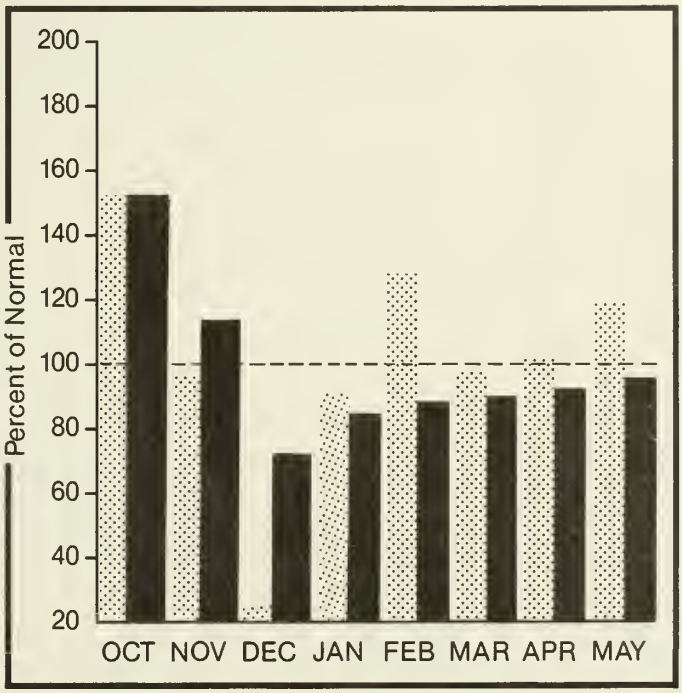
SPOKANE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Reservoir storage in Coeur d' Alene Lake is near average at 96%. Only one snow course was read in the basin this month and that showed 52% of normal. Streamflow in the Spokane River was 55% of normal for May, and the May-September flows are forecasted to be 52% of average. Temperatures averaged 1 degree above normal with the last week of May outweighing the much cooler first two weeks of the month.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SPOKANE at Post Falls	MAY-SEP	1977.0	1030.0	52	74	30				
	MAY-JUL	1884.0	970.0	51	73	30				

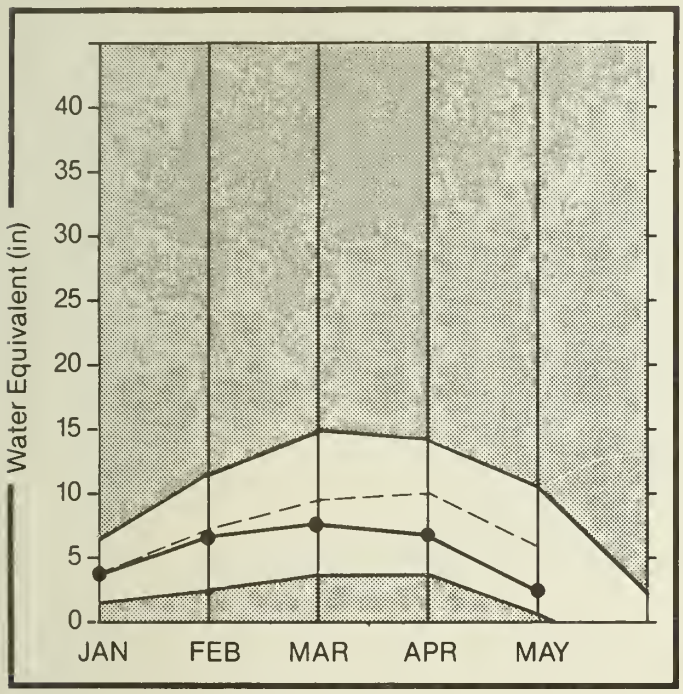
RESERVOIR STORAGE (1000AF)				
RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.
COEUR D'ALENE	225.1	215.0	253.7	---

WATERSHED SNOWPACK ANALYSIS			
WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Spokane River	2	68	49

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

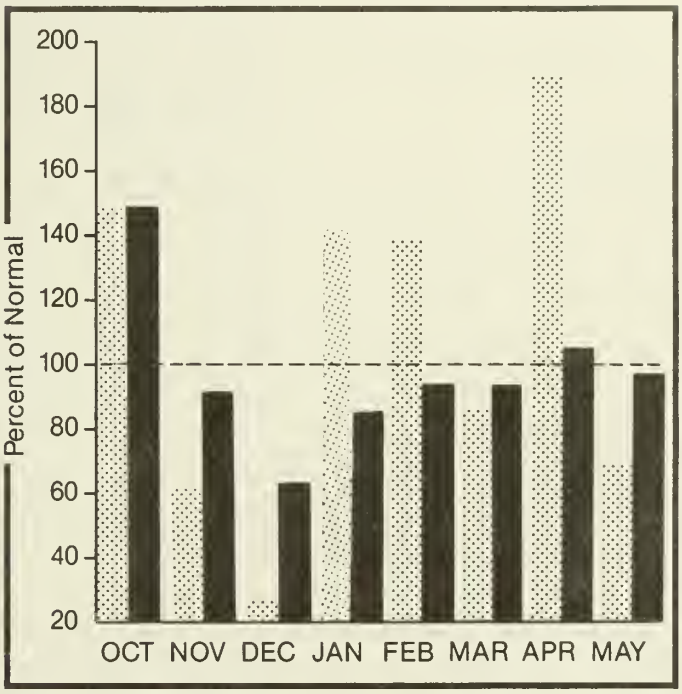
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

The Bunchgrass SNOTEL site was bare of snow on June 1. The last week in May saw nearly one foot of snow water leave the site. Streamflows in the basin for May were as follows: the Pend Oreille 74%, Kettle River 97% and the Columbia River at the International Boundary 90%. Precipitation for May was 68% of average bringing the year to date total down to 96% of average. Streamflows for May-July are forecast to be 79% on the Kettle River, 65% on the Colville and 66% on the Pend Oreille River.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	MAY-SEP	13316.0	8830.0	66	86	46				
	MAY-JUL	12047.0	7900.0	66	86	46				
	MAY-JUN	10119.0	6680.0	66	86	46				
CHAMOKANE CREEK	JUL-AUG	3.6	2.9	81	111	28				
COLVILLE RIVER at Kettle Falls	MAY-SEP	85.1	55.0	65	101	28				
	MAY-JUL	74.3	48.0	65	101	28				
	MAY-JUN	66.0	43.0	65	102	29				
KETTLE RIVER nr Laurier	MAY-SEP	1581.0	1260.0	80	98	62				
	MAY-JUL	1491.0	1180.0	79	97	61				
	MAY-JUN	1334.0	1050.0	79	97	61				
COLUMBIA RIVER at Birchbank *	MAY-SEP	41733.0	40600.0	97	110	84				
	MAY-JUL	32833.0	31800.0	97	110	84				
	MAY-JUN	23155.0	22460.0	97	110	84				
COLUMBIA RIVER at Grand Coulee *	MAY-SEP	60100.0	53600.0	89	100	78				
	MAY-JUL	49400.0	43500.0	88	99	77				
	MAY-JUN	37300.0	32820.0	88	99	77				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROOSEVELT	5232.0	2990.6	1661.6	2851.0
BANKS	715.0	688.2	685.5	418.0

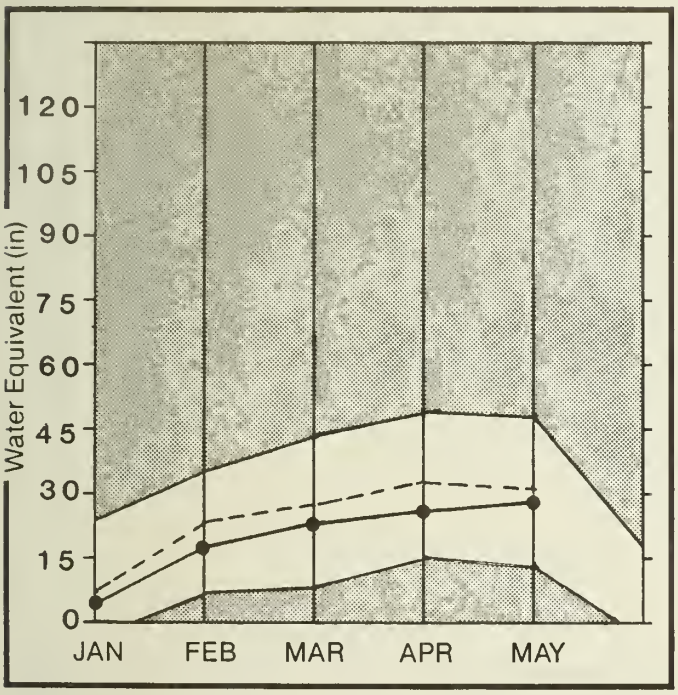
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	0	0	0
Pend Oreille River	4	57	37
Kettle River	1	0	0
Omac Lake, Twin Lakes	0	0	0
Newman Lake	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

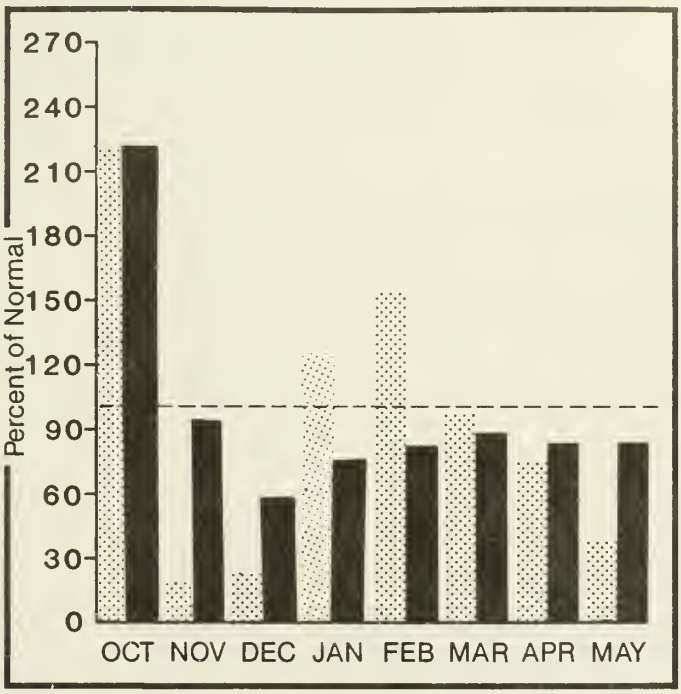
OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Reservoir storage in the Okanogan Basin is near average. Precipitation for the Month of May was 35% of normal bringing the year to date to 82% of average. There were eight manual snow courses read in the Okanogan Basin for the June 1. Snow cover averaged 92% of normal. These courses were in the Canadian part of the basin. Streamflows during the last week of May were at flood stage on the Okanogan River. For May the flow averaged 98% for the Okanogan and 97% on the Similkameen.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	MAY-SEP	1376.0	1070.0	78	106	50				
	MAY-JUL	1279.0	990.0	77	105	49				
	MAY-JUN	1075.0	830.0	77	105	49				
OKANOGAN R. nr Tonasket	MAY-SEP	1517.0	1180.0	78	107	49				
	MAY-JUL	1370.0	1060.0	77	106	48				
	MAY-JUN	1135.0	870.0	77	106	48				
METHOW RIVER nr Pateros	MAY-SEP	900.0	720.0	80	104	56				
	MAY-JUL	828.0	650.0	79	103	54				
	MAY-JUN	693.0	555.0	80	104	56				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.
CONCONULLY LAKE (SALMON)	10.5	9.2	10.5	9.0
CONCONULLY RESERVOIR	13.0	9.3	11.8	9.0

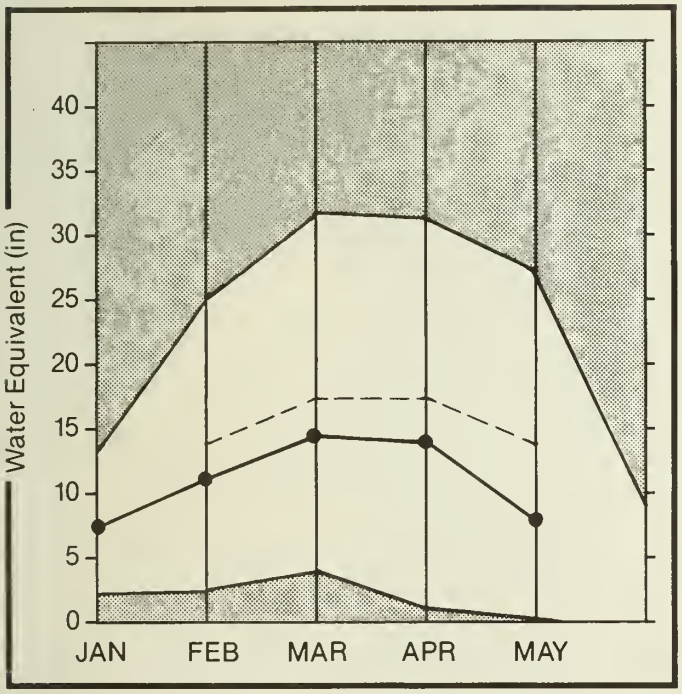
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Okanogan River	8	184	92
Methow River	0	0	0

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

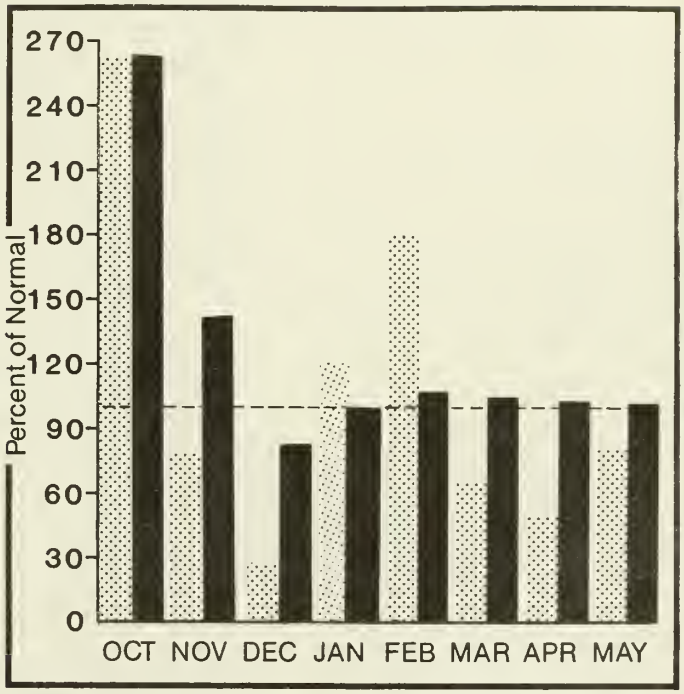
WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasted streamflow are 79% of average for the Wenatchee at Plain and 80% of normal on the Entiat Rivers and Chelan River. May streamflow was 91% of normal on the Chelan River, and 81% on the Wenatchee. Precipitation was 79% of average over the basin bringing the water year to date to 101% of normal. Storage in Chelan Lake was 599,000 acre feet or 133% of average.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	MAY-SEP	1094.0	880.0	80	95	65				
	MAY-JUL	946.0	760.0	80	95	65				
	MAY-JUN	717.0	580.0	81	96	66				
STEHEKIN R. at Stehekin	MAY-SEP	860.0	710.0	83	93	73				
	MAY-JUL	727.0	600.0	83	93	72				
	MAY-JUN	553.0	460.0	83	93	73				
ENTIAT RIVER nr Ardenvoir	MAY-SEP	218.0	170.0	78	93	63				
	MAY-JUL	197.0	160.0	81	96	66				
	MAY-JUN	155.8	124.0	80	94	65				
WENATCHEE RIVER at Plain	MAY-SEP	1136.0	900.0	79	112	46				
	MAY-JUL	1002.0	790.0	79	112	46				
	MAY-JUN	765.0	600.0	78	111	45				
WENATCHEE R. at Peshastin	MAY-SEP	1523.0	1190.0	78	111	45				
	MAY-JUL	1356.0	1060.0	78	111	45				
	MAY-JUN	1048.0	820.0	78	111	45				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	105.0	76	109	43				
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	280.0	76	109	43				
	APR-JUL	340.0	265.0	78	111	45				
	APR-JUN	270.0	210.0	78	111	45				
COLUMBIA R. bl Rock Island Dam *	MAY-SEP	65550.0	58700.0	90	101	79				
	MAY-JUL	54375.0	48000.0	88	99	77				
	MAY-JUN	41160.0	36225.0	88	99	77				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CHELAN LAKE	676.1	599.0	428.2	---

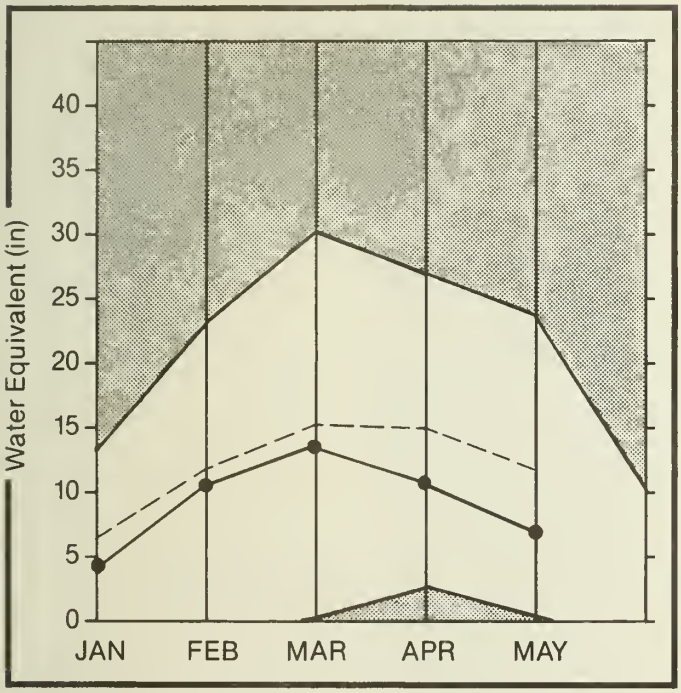
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	0	0	0
Entiat River	0	0	0
Wenatchee River	0	0	0
Colockum Creek	0	0	0
Squilchuck Creek	0	0	0
Stemilt Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

YAKIMA

Mountain snowpack* (inches)



*Based on selected stations

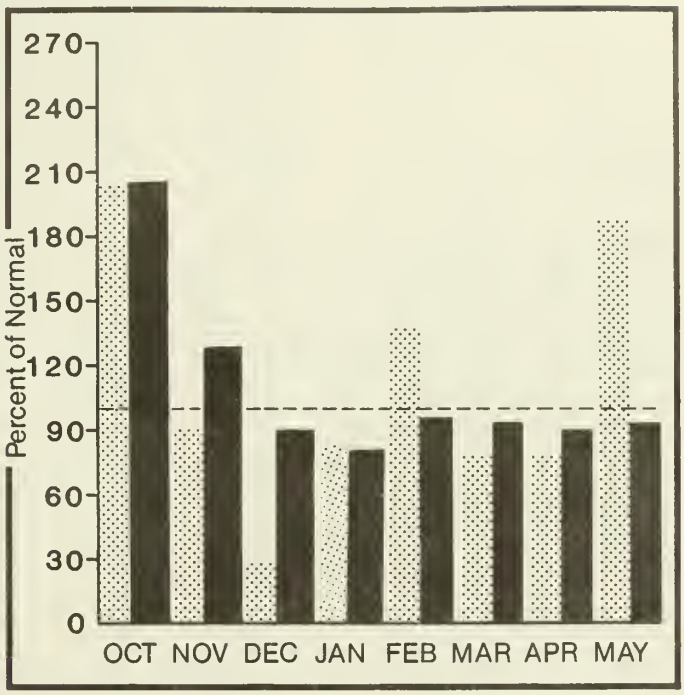
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

The overall outlook for the Yakima River Basin has not changed significantly from last month. Streamflow forecasts range from 72 to 80% throughout the entire basin. Precipitation was above average for May at 186% bringing the water year to date to 93% of normal. Storage in the five major reservoirs was at 937,600 acre feet or 100% of average. May streamflow was 50%of average.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	MAY-SEP	114.0	90.0	79	91	67				
	MAY-JUL	103.0	80.0	78	89	66				
	MAY-JUN	86.0	68.0	79	91	67				
YAKIMA RIVER at Cle Elum *	MAY-SEP	780.0	610.0	78	91	65				
	MAY-JUL	693.0	540.0	78	91	65				
	MAY-JUN	574.0	450.0	78	91	65				
YAKIMA RIVER nr Parker *	MAY-SEP	1711.0	1230.0	72	91	53				
	MAY-JUL	1510.0	1080.0	72	91	53				
	MAY-JUN	1274.0	920.0	72	91	53				
KACHESS RIVER nr Easton *	MAY-SEP	98.0	76.0	78	92	63				
	MAY-JUL	92.0	71.0	77	91	63				
	MAY-JUN	78.0	60.0	77	91	63				
CLE ELUM RIVER nr Roslyn *	MAY-SEP	400.0	310.0	78	90	66				
	MAY-JUL	360.0	277.0	77	89	65				
	MAY-JUN	291.0	225.0	77	89	65				
BUMPING RIVER nr Nile *	MAY-SEP	126.0	100.0	79	94	64				
	MAY-JUL	114.0	90.0	79	94	64				
	MAY-JUN	91.0	73.0	80	96	65				
AMERICAN RIVER nr Nile	MAY-SEP	114.0	90.0	79	91	67				
	MAY-JUL	103.0	80.0	78	89	66				
	MAY-JUN	82.0	65.0	79	91	67				
TIETON RIVER at Tieton *	MAY-SEP	214.0	164.0	77	93	61				
	MAY-JUL	175.0	135.0	77	93	61				
	MAY-JUN	133.0	102.0	77	92	61				
NACHES RIVER nr Naches *	MAY-SEP	728.0	570.0	78	92	64				
	MAY-JUL	645.0	500.0	78	91	64				
	MAY-JUN	530.0	415.0	78	92	64				
AHTANUM CREEK nr Tampico *	MAY-SEP	39.0	29.0	74	97	51				
	MAY-JUL	35.0	26.0	74	97	51				
	MAY-JUN	29.0	22.0	76	97	55				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
KEECHELUS	157.8	125.1	154.0	144.0
KACHESS	239.0	213.9	236.7	218.0
CLE ELEM	436.9	384.5	352.4	378.0
BUMPING LAKE	33.7	34.5	32.8	27.0
RIMROCK	198.0	179.9	157.2	167.0

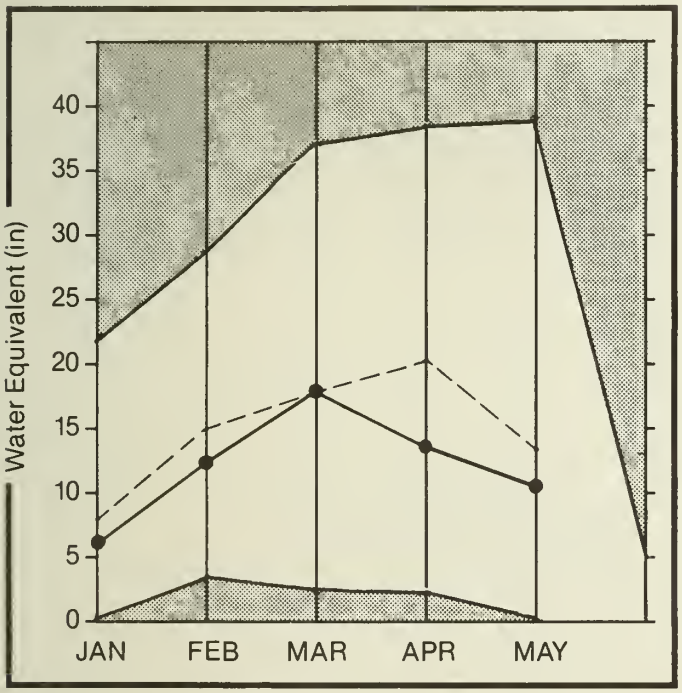
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	3	24	15
Ahtanum Creek	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WALLA WALLA

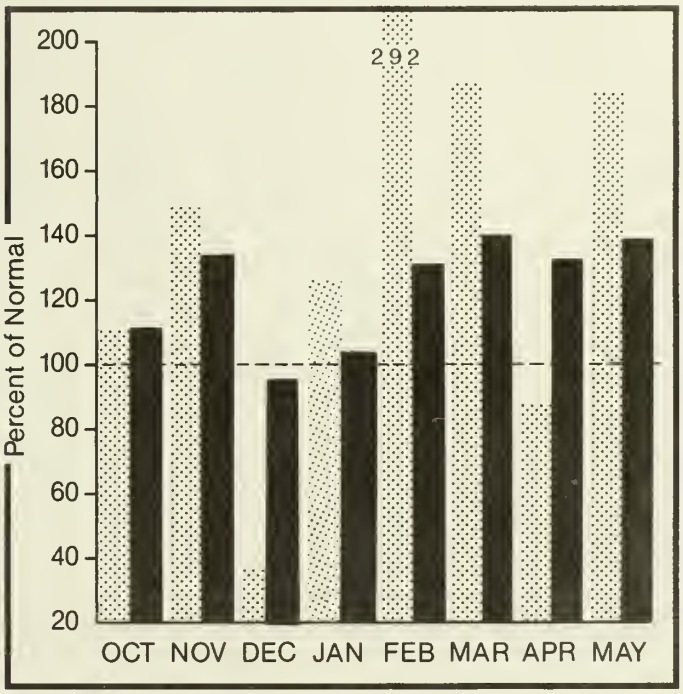
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Precipitation was at 183% of average for May which brought the water year to date total to 138% of normal. Streamflow in the Walla Walla River was 74% of average for May. Forecasted streamflow in the Walla Walla River is 76% of normal for the May-July period. Temperatures for the month were average with the cold first two weeks balanced out by the warmer temperatures last week. Snow has melted at the Touchet SNOTEL site.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK NEAR WALLA WALLA	MAY-SEP	7.7	5.9	77	117	39				
	MAY-JUN	7.3	5.5	75	110	41				
	MAY-JUL	7.5	5.7	76	120	40				
COLUMBIA R. at The Dalles x	MAY-SEP	88290.0	77800.0	88	101	75				
	MAY-JUL	73760.0	62800.0	85	98	72				
	MAY-JUN	57360.0	48800.0	85	98	72				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.

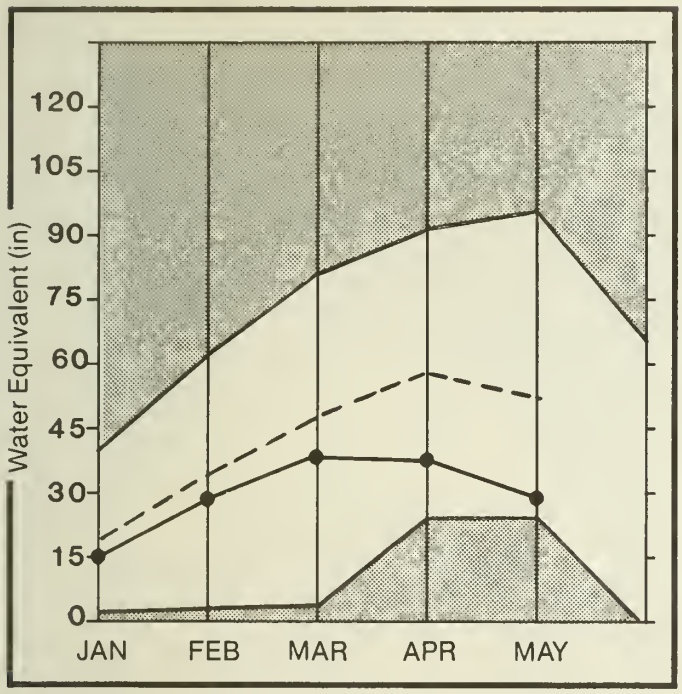
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Mill Creek	0	0	0

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

COWLITZ AND LEWIS

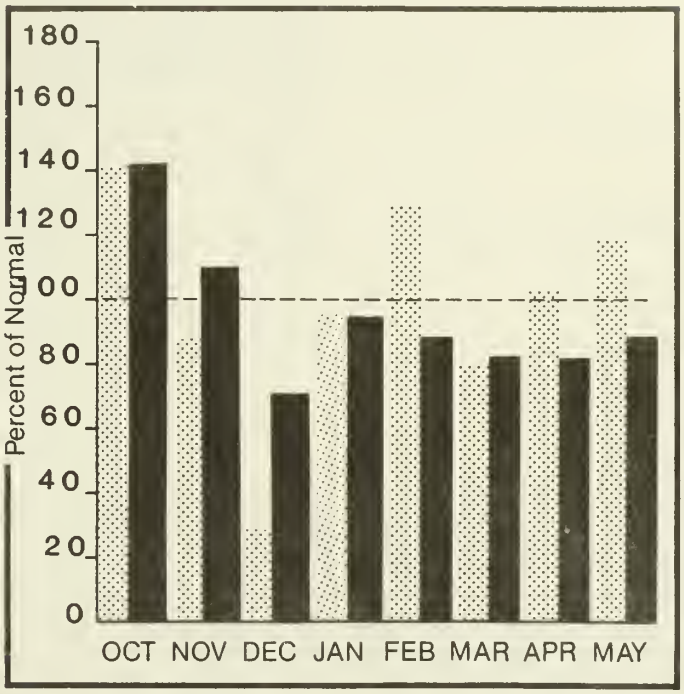
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Nearly all snow has melted from the watershed during the last week in May. The SNOTEL sites above 4000 feet are showing small amounts of water left on the pillows. Precipitation during May was 118% of normal bringing the water year to date to 88% of average. Streamflow for May was 97% of normal on the Cowlitz River. Forecasted streamflow on the Lewis River for the May-July period is 88% of average and 80% for the Cowlitz River at Castle Rock.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel x	MAY-SEP	900.0	790.0	88	112	64				
	MAY-JUL	737.0	650.0	88	112	64				
	MAY-JUN	612.0	540.0	88	112	64				
COWLITZ R. bl Mayfield Dam x	MAY-SEP	1617.0	1250.0	77	126	28				
	MAY-JUL	1357.0	1045.0	77	126	28				
	MAY-JUN	1081.0	830.0	77	126	28				
COWLITZ R. at Castle Rock x	MAY-SEP	2058.0	1650.0	80	129	31				
	MAY-JUL	1708.0	1370.0	80	129	31				
	MAY-JUN	1365.0	1090.0	80	129	31				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.

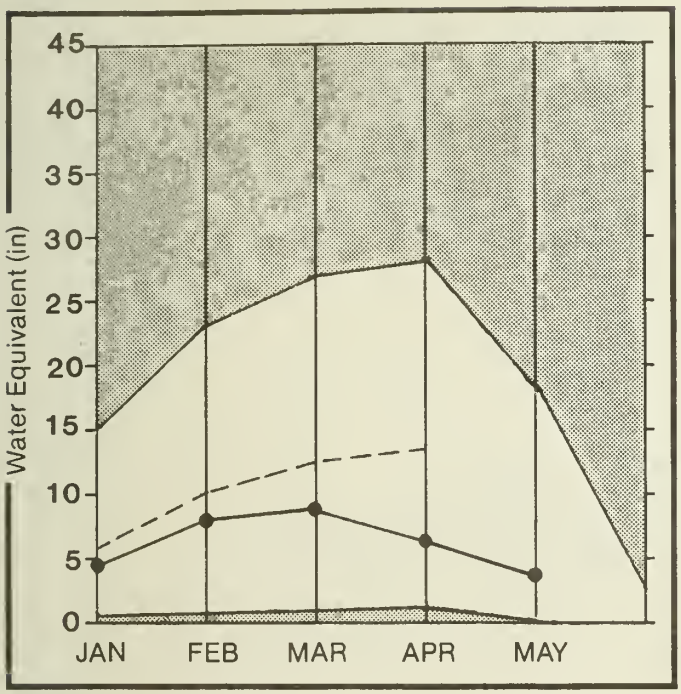
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Cowlitz River	1	30	8
Lewis River	0	0	0

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

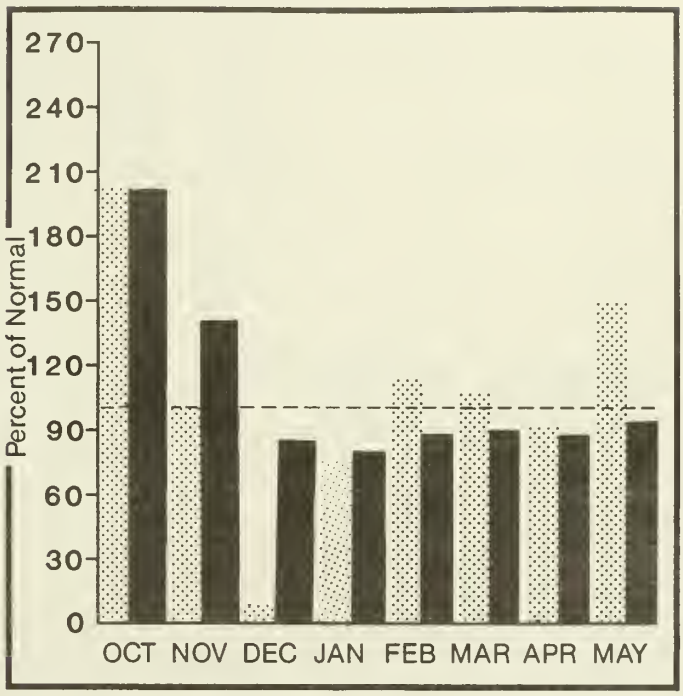
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation for May was 149% of average in the Green-White River Basins. Forecasted streamflow remains below normal with 70% forecast for the Green River and 73% on the Cedar River. The year to date precipitation is 93% of normal.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam x	MAY-SEP	316.0	225.0	71	88	54				
	MAY-JUL	284.0	200.0	70	87	54				
	MAY-JUN	256.0	180.0	70	82	48				
CEDAR RIVER nr Cedar Falls	MAY-SEP	74.2	54.0	73	90	55				
	MAY-JUL	65.5	48.0	73	90	56				
	MAY-JUN	54.1	40.0	74	91	57				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.

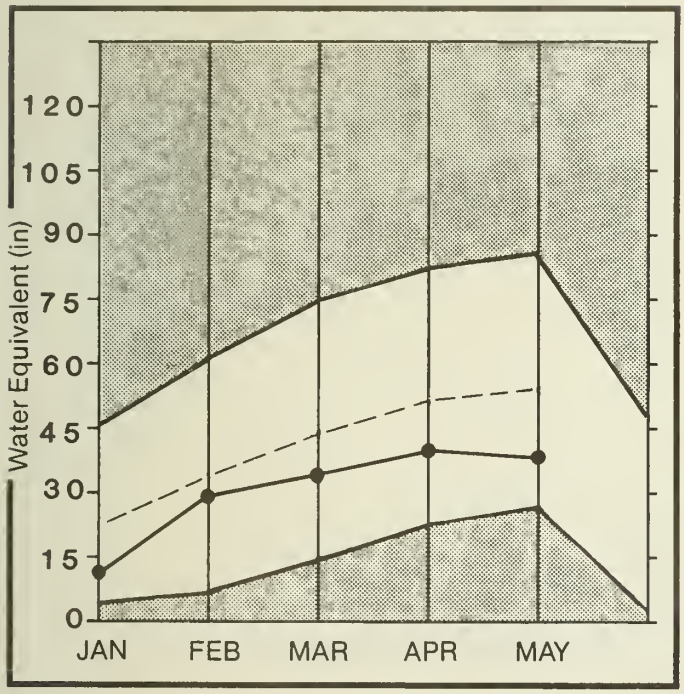
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
White River	0	0	0
Green River	1	23	20

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

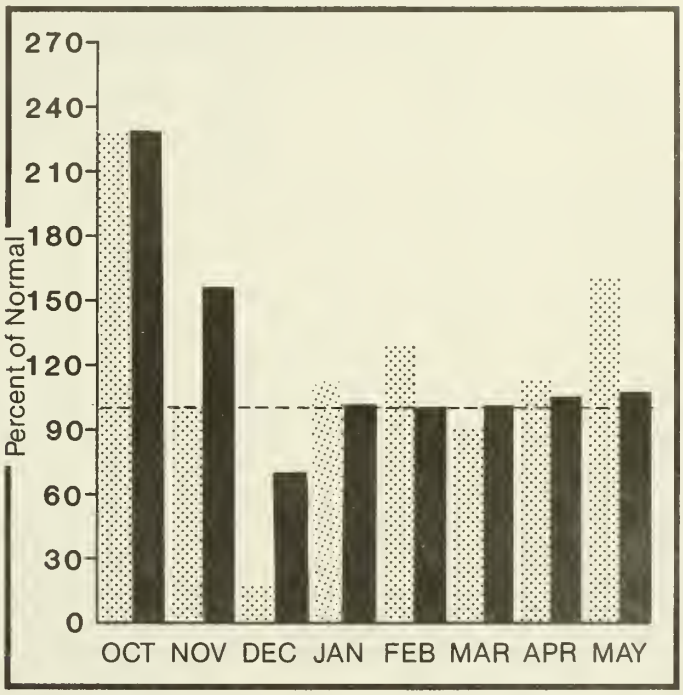
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current

Monthly precipitation
Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

There were no manual snow courses read for the June 1 reporting period. The Harts Pass SNOTEL site has 29.1 inches of water content remaining on the pillows as of the June 1. Precipitation for the month of May averaged 160% of normal bringing the water year to date to 107% of average. Streamflow for May was 82% of normal on the Skagit River. Forecasted streamflow for the Skagit River for the May-July period is 80% of average. Reservoir storage in Ross is 112% of normal for June 1.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem x	MAY-AUG	2532.0	2030.0	80	95	65				
	MAY-SEP	2356.0	1880.0	80	95	65				
	MAY-JUL	1972.0	1580.0	80	95	65				
	MAY-JUN	1485.0	1190.0	80	95	65				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.
ROSS	1404.1	1160.9	1011.5	---
DIABLO RESERVOIR	90.6	87.2	86.8	---
GORGE RESERVOIR	9.8	7.5	8.2	---

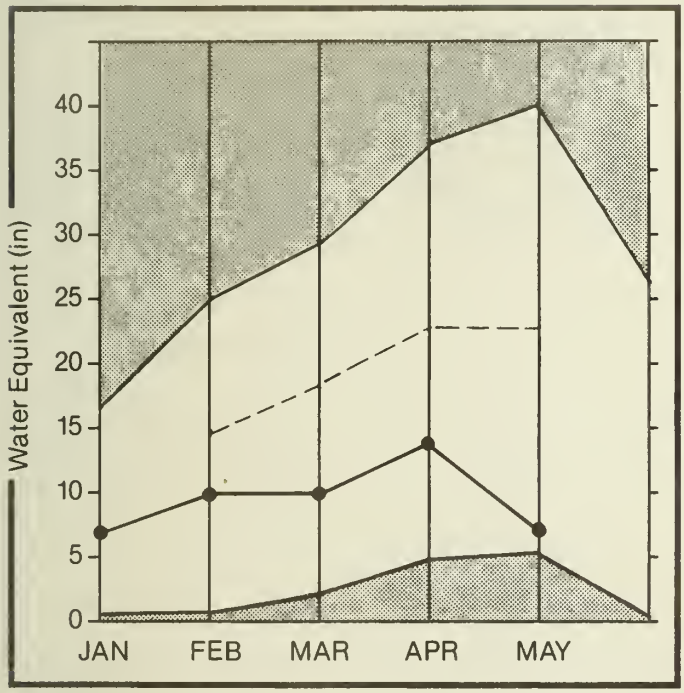
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Skagit River	0	0	0
Baker River	0	0	0
Cedar River	0	0	0
Snoqualmie River	0	0	0
Skykomish River	0	0	0

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

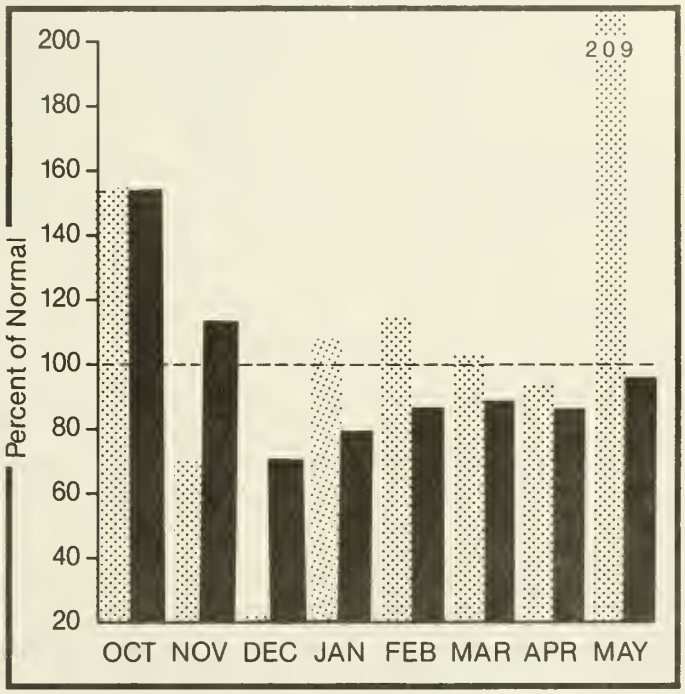
OLYMPIC

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum — Minimum — Average — Current

Monthly precipitation — Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasts of streamflow for the Olympic Peninsula Rivers is much the same as last month at 72-73% for the May-July period. Precipitation for May was 209% of average with the Quillayute WSO reporting 11.02 inches. The water year to date total is 95% of average. All snow has left the Carrol Pass snow pillow.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	MAY-SEP	160.0	116.0	73	89	56				
	MAY-JUL	130.0	94.0	72	89	55				
	MAY-JUN	97.0	70.0	72	89	56				
ELWHA RIVER nr Port Angeles	MAY-SEP	553.0	400.0	72	89	55				
	MAY-JUL	454.0	325.0	72	89	55				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Dungeness River	0	0	0
Morse Creek	0	0	0
Elwha River	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

CONSERVE YOUR IRRIGATION WATER

Can irrigators use less water and get good yields? We think so. With energy costs on an upward spiral and water shortages likely, we offer these water saving ideas to irrigators.

Consider ditch lining or gated pipe. This will reduce the 10-90 percent loss which occurs in earch ditches.

Keep ditches clean and free from weeds, sediment, or other debris, which can slow water velocity, affect delivery rate, and increase evaporation.

Make sure headgates, drop structures, and pipe inlets are operational. A washed-out structure is water lost.

Inspect ditchbanks for rodent damage. Rodent holes cause leakage or failures.

Make sure sprinkler nozzles aren't worn or leaky. Check pipe connections and valves to prevent leaks.

Operate sprinklers at recommended pressure to effectively use available water.

Maintain your pump at peak efficiency to save energy.

BETTER WATER MANAGEMENT

Better water management may require more labor. It may require changing a head of water in the middle of the night. But it will be worth it. You should:

Measure your water to determine how much is applied.

Consider alternate row irrigation for crops planted in furrows.

Plan short runs. Match stream size and velocity to soil intake rate and capacity.

Catch and reuse tail water.

Underirrigate the lower end of field to stretch your water.

And when water is short, consider eliminating that last irrigation.

Soil Conservation Service personnel can:

Help plan and design new irrigation systems or evaluate existing ones.

Provide technical assistance for land leveling, pipeline installation, and other practices.

KNOW YOUR SOIL

Soil absorbs irrigation water at a given rate. This varies with each soil type. Some crops require more water than others. Check soil moisture by spade, probe, or moisture meter. Or use the "feel" method.

WHEN IRRIGATION IS NEEDED, SOIL WILL FEEL AND ACT THIS WAY

Soil Texture	A handful of soil will
Coarse	Tend to stick together slightly, but will not form a ball.
Medium	Be crumbly, but will form a ball.
Fine	Be pliable, and will form a ball.

If you have a conservation plan on your farm, or if the soil in your area has been mapped, the Soil Conservation Service can crosscheck soil type and irrigation data and provide you with the water holding capacity of your soil for a given crop.

Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC

Office		(509) 335-7376
Farm		(509) 335-9689

OLYMPIA, Area I

Area Office	FTS	434-9454 or 9455
Chehalis		(206) 748-0083
Kelso		(206) 425-1880
Lake Stevens	FTS	392-9259
Lynden		(206) 354-5658
Montesano		(206) 249-5900
Mt. Vernon		(206) 424-5153
Olympia FO	FTS	434-9448
Port Angeles	FTS	396-4277
Port Orchard		(206) 876-5529
Puyallup		(206) 845-5533
Raymond		(206) 942-5945
Renton	FTS	399-3325 or 3326
Vancouver	FTS	422-7631

EPHRATA, AREA II

Area Office	FTS	446-4374 or 4375
Davenport		(509) 725-4181 or 725-1345
Ephrata FO	FTS	446-4385
Moses Lake		(509) 765-3261
Okanogan		(509) 422-2750
Othello		(509) 488-2802
Ritzville		(509) 659-0254
Waterville		(509) 745-8362
Wenatchee	FTS	390-0242 or 0260

YAKIMA, AREA III

Area Office	FTS	446-5865 or 5866
Ellensburg		(509) 925-5375
Goldendale		(509) 773-5823
Pasco		(509) 545-8546 or 8547
Prosser		(509) 786-1923
Sunnyside		(509) 837-7911
Toppenish		(509) 865-4012
Walla Walla	FTS	434-6340
White Salmon		(509) 493-1936
Yakima FO	FTS	446-5909

SPOKANE, AREA IV

Area Office	FTS	439-3726
Cheney		(509) 458-6200, Ext 2309
Clarkston		(509) 758-8012
Colfax		(509) 397-4636
Colville		(509) 684-5067
Dayton		(509) 382-2351
Fairfield		(509) 283-2331
Newport		(509) 447-4217
Pomeroy		(509) 843-1998
Republic		(509) 775-3473
Spokane FO	FTS	439-2120

SOIL SURVEY OFFICES

Bellingham		(206) 676-3520
Inchelium		(509) 722-4395
Nespelem	FTS	439-9431
Wapato		(509) 877-4004

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
- Corps of Engineers

U.S. Department of Agriculture
- Forest Service

U.S. Department of Commerce
- NOAA, National Weather Service

U.S. Department of the Interior
- Bonneville Power Administration
- Bureau of Reclamation
- Geological Survey
- National Park Service
- Bureau of Indian Affairs

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-200D LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712

51.573
In36wwa

United States
Department of
Agriculture

**Soil
Conservation
Service**

Spokane,
Washington

Washington Water Supply Outlook

January 1, 1987

The Library of the
MAR 05 1987
University of Illinois
at Urbana-Champaign

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Denver, CO 80211
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 97102
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97208
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA are available to everyone without regard to race, creed, color, sex, age, handicap or national origin.

TABLE OF CONTENTS

STATE STREAMFLOW PROSPECTS MAP 1

STATE GENERAL OUTLOOK 2

BASIN OUTLOOK AND CONDITIONS

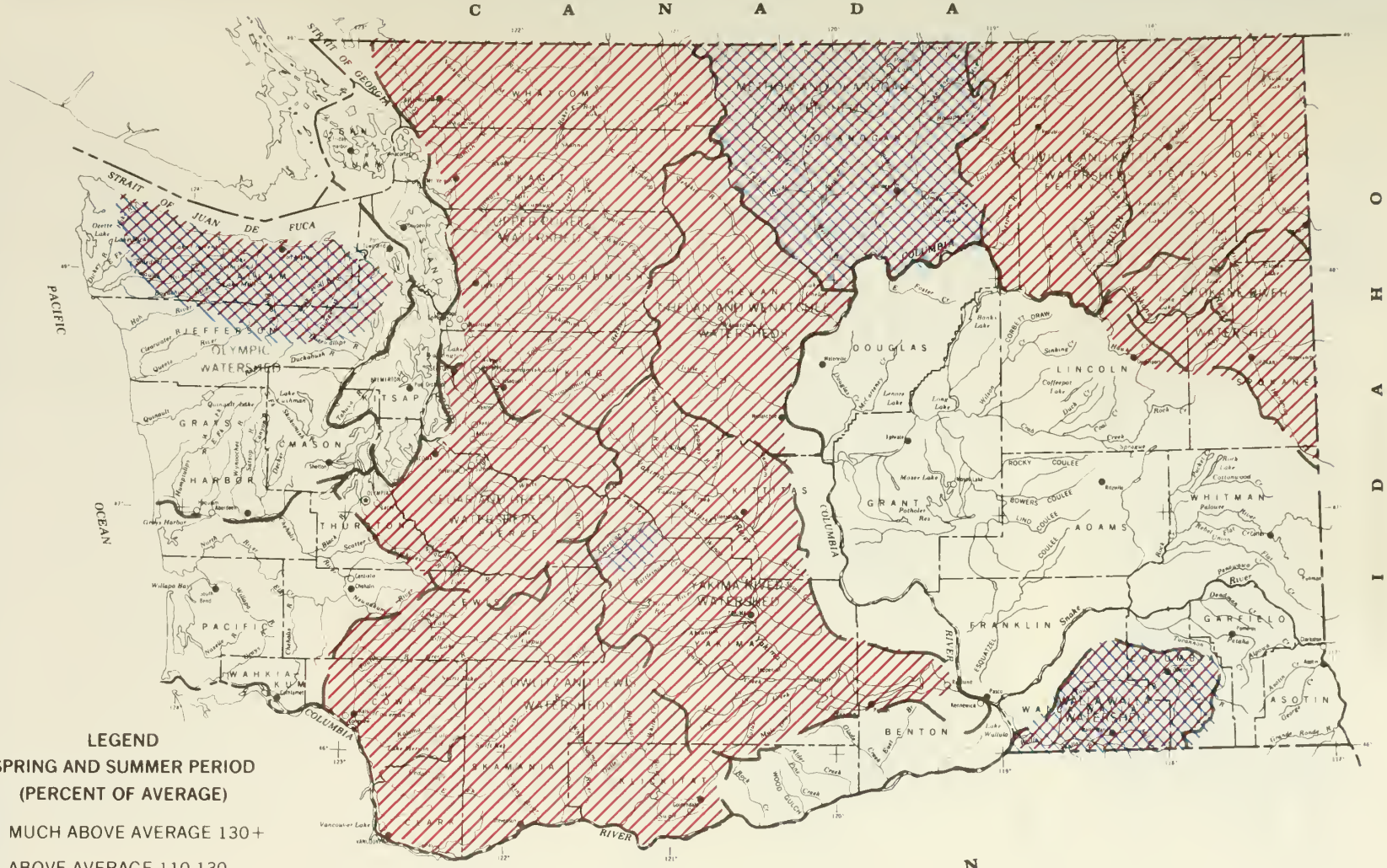
- SPOKANE 4
- COLVILLE AND PEND OREILLE 6
- OKANOGAN AND METHOW 8
- WENATCHEE AND CHELAN 10
- YAKIMA 12
- WALLA WALLA 14
- COWLITZ AND LEWIS 16
- WHITE - GREEN 18
- NORTH PUGET SOUND 20
- OLYMPIC 22

SNOW DATA 24

ADDITIONAL NFORMATION 26

U S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE


C A N A D A
I D A H O
O R E G O N
PACIFIC OCEAN
STRAIT OF JUAN DE FUCA
STRAIT OF GEORGIA
COLUMBIA RIVER
WHATCOM
SKAGIT
SNOHOMISH
KING
KITSAP
MASON
JEFFERSON
GRAYS HARBOR
THURSTON
PACIFIC
LEWIS
WAHKIAKUM
CLARK
SKAMANIA
KLICKITAT
YAKIMA
KITTITAS
CHELAN
DOUGLAS
LINCOLN
GRANT
ADAMS
WHITMAN
FRANKLIN
GARFIELD
COLUMBIA
WALLA WALLA
BENTON
ASOTIN
OKANOGAN
FERRY
STEVENS
PEND OREILLE
OLYMPIC WATERSHED
UPPER CHEHALIS WATERSHED
SNOHOMISH WATERSHED
CHELAN AND WENATCHEE WATERSHEDS
YAKIMA RIVER WATERSHED
LOWER CHEHALIS WATERSHED
COWLITZ AND LEWIS WATERSHEDS
WALLA WALLA WATERSHED
PEND OREILLE WATERSHED
ROCKY COULEE
BOWERS COULEE
LIND COULEE
Snake RIVER
Vancouver Lake
Willapa Bay
Grays Harbor
Puget Sound
Lake Wallula
Lake Roosevelt
Banks Lake
Coffeepot Lake
Moses Lake
Potholes Res
Long Lake
Lenore Lake
Sinbing Cr
Cottonwood
Palouse
Pataha
Tucannon
Asotin
Grande Ronde R
Pomeroy
Dayton
Prosser
Kennewick
Pasco
Ephrata
Wenatchee
Leavenworth
Cashmere
Chelan
Entiat
Omak
Okanogan
Tonasket
Republic
Colville
Kettle Falls
Newport
Metaline Falls
Ione
Cusick
Pullman
Colfax
Ritzville
Lind
Odessa
Davenport
Reardan
Sprague
Cheney
Medical Lake
Spokane
Deer Park
Chewelah
Ford
Springdale
Loomis
Tonasket
Oroville
Twisp
Winthrop
Mazama
Methow
Carlton
Pateros
Brewster
Bridgeport
Mansfield
Waterville
Coulee City
Wilbur
Creston
Harrington
Ione
Cusick
Metaline Falls
Kettle Falls
Colville
Republic
Tonasket
Omak
Okanogan
Chelan
Leavenworth
Cashmere
Wenatchee
Ephrata
Moses Lake
Quincy
Mattawa
Othello

GENERAL OUTLOOK

SUMMARY:

Washington water supply forecasts are for below normal runoff for 1987. Snow cover and Precipitation are below average continuing a trend set last year. Reservoir storage is below normal at the major irrigation projects throughout the state. Streamflows have been below the norm for late summer and fall months.

NOTE: Included in this years reports is the snow survey data.

SNOWPACK:

Very few manual snow measurements were scheduled and made for the January 1 period. Forecasters must rely on SNOTEL data for snowpack information. The January 1 statewide average is 73%. Storms during early January have made improvements to the snowpack. All Washington SNOTEL Sites are reporting snowpack, with Lyman Lake at 5900 feet in elevation having the largest with 27.1 inches of water content. The Columbia River Basin has a snowpack 63% of normal.

PRECIPITATION:

Precipitation values from SNOTEL sites indicate a water year value near 85% of average for the high mountain areas. Precipitation data from the National weather service sites, located mostly in lower valley areas, show values around the state vary from 35% in the Spokane Basin to 82% of normal for the Olympic Basin. Storms, the first week in January, have deposited over 5 inches at many sites along the Cascade Mountain range.

RESERVOIRS:

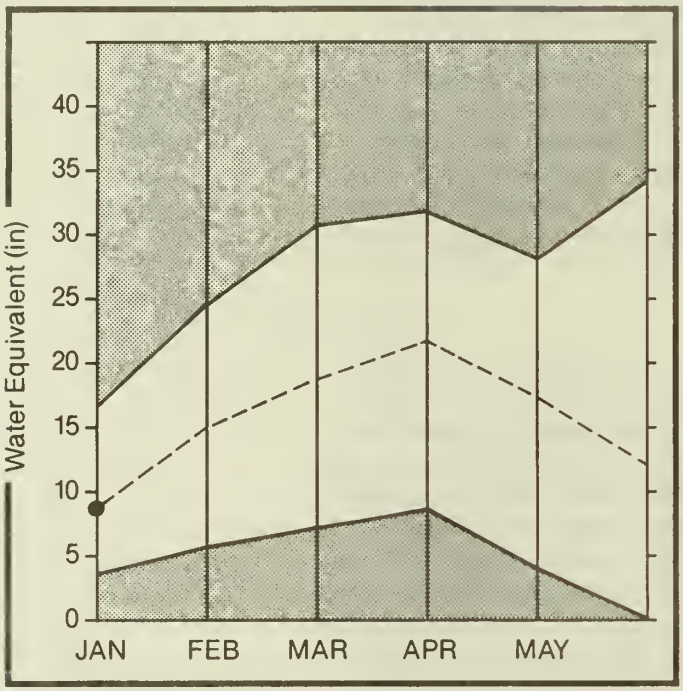
Reservoir storage is below average in Washington. Major irrigation reservoirs were drawn low the preceding summer when water supplies were also below normal. The Yakima Basin, which relies heavily upon stored water for irrigation, is at 58% of average. Columbia River reservoirs are near normal while storage in the Okanogan area is at 57% of capacity. Power reservoirs, such as Coeur d' Alene at 65% and Chelan Lake at 96% of normal, are suffering from low flows of last fall.

STREAMFLOW:

Streamflows are forecasted to be below normal for the coming spring and summer. Snowpack and water year to date precipitation values are below average over most of Washington. Forecasts vary from 72% in the Similkameen River to 93% in the Bumping River. December streamflows continued the summer and fall trend of below normal with only the Okanogan River at 101% being above average. Other December streamflows are; Spokane at Long Lake 76%, Pend Oreille River 75%, Columbia River at the International Boundary 86%, Chelan 65%, Snake 93%, Skagit 63%, and the Chehalis River 50%.

SPOKANE

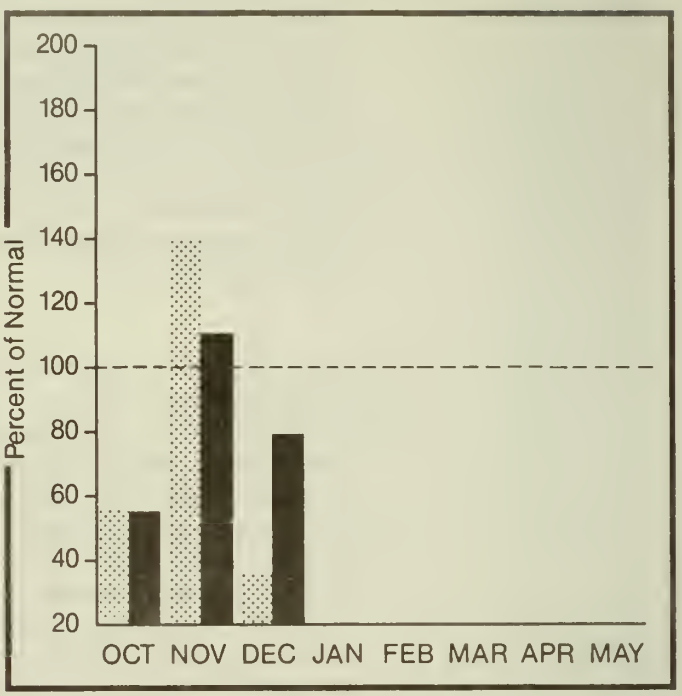
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Spokane River's forecasted spring and summer runoff is 88% of normal. This forecast is based upon a snowpack that is 89% of average and a water year to date precipitation value of 79% of normal. Data for snow cover was obtained from SNOTEL sites with no manual measurements made for the January 1 period. December streamflow in the Spokane River was 76% of normal. Storage in Coeur d' Alene Lake was 134,200 acre feet compared to 184,200 last year, average storage in Cd'A for January 1 is 207,700 ac. ft.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
SPOKANE at Post Falls	APR-SEP	2848	2480	87.	3932	138	1028	36.
	APR-JUL	2754	2400	87.	3805	138	995	36.

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

RESERVOIR STORAGE (1000AF)

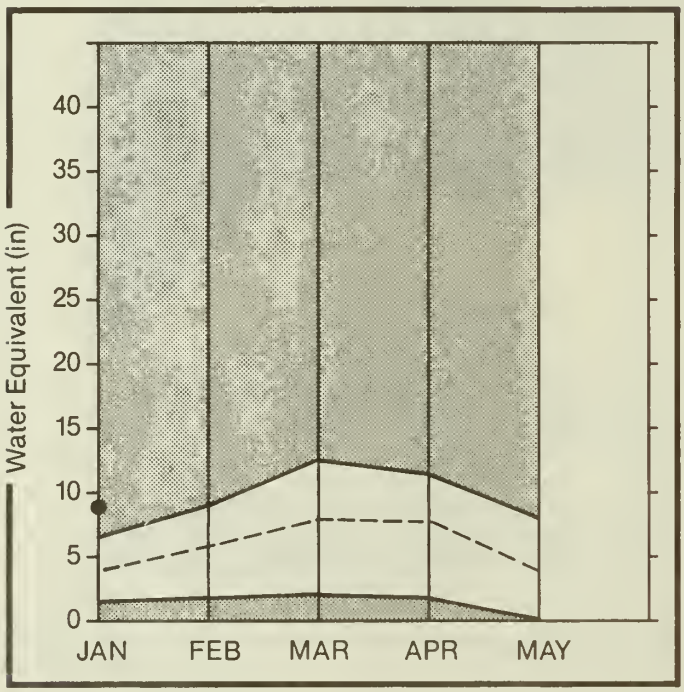
RESERVOIR	USABLE CAPACITY	** USABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
COEUR D'ALENE	291.2	134.2	91.7	205.4

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Spokane River	13	121	84

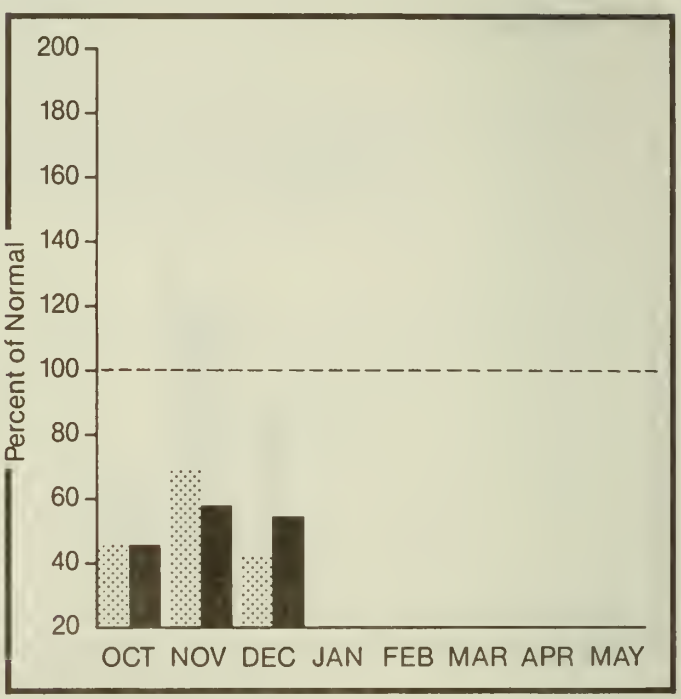
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Forecasted streamflows for the Pend Oreille River is 84%, Kettle River 84% and the Colville River 82% of normal for the spring and summer runoff period. Streamflows for December were 75% of average on the Pend Oreille River, 72% on the Kettle River and 86% on the Columbia River at the international Boundary. Snowpack measurements in the Pend Oreille Basin are at 89% of normal based mainly on SNOTEL measurements. Manual measurements of snow will begin February 1. Precipitation during December was 41% of average and water year to date values are 54% of normal.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425	13000	84.	17011	110	8990	58.
	APR-JUL	14156	12000	85.	15681	111	8319	59.
	APR-JUN	12227	10000	82.	13179	108	6821	56.
COLVILLE RIVER at Kettle Falls	APR-SEP	134	110	82.	177	132	43	32.
	APR-JUL	123	100	81.	162	132	39	32.
	APR-JUN	114	90	79.	147	129	33	29.
KETTLE RIVER nr Laurier	APR-SEP	1829	1540	84.	2363	129	717	39.
	APR-JUL	1738	1460	84.	2242	129	678	39.
	APR-JUN	1581	1260	80.	1971	125	549	35.
COLUMBIA RIVER at Birchbank 2	APR-SEP	44605	40300	90.	50113	112	30487	68.
	APR-JUL	35705	32200	90.	40055	112	24345	68.
	APR-JUN	26027	23500	90.	29226	112	17774	68.
COLUMBIA RIVER at Grand Coulee 2	APR-SEP	66841	58400	87.	73105	109	43695	65.
	APR-JUL	56169	48900	87.	61257	109	36543	65.
	APR-JUN	44036	38300	87.	47988	109	28612	65.

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

RESERVOIR STORAGE (1000AF)

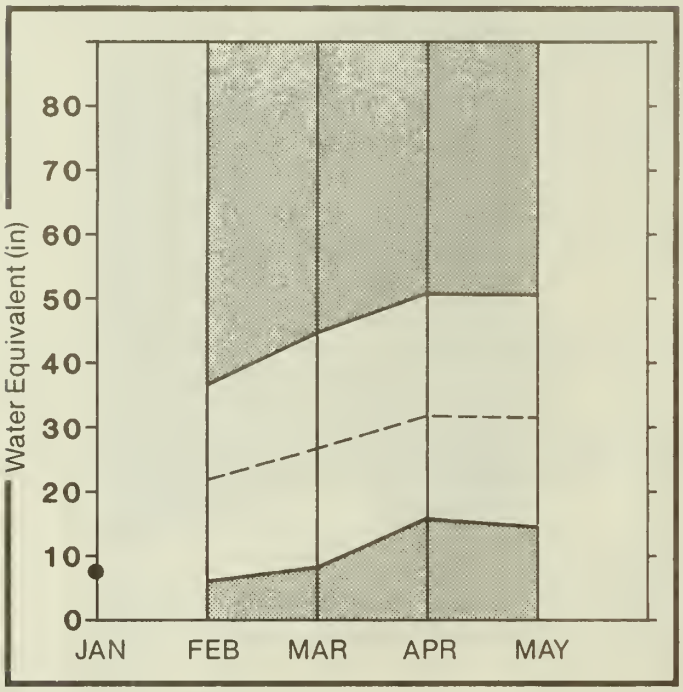
RESERVOIR	USABLE CAPACITY	** USABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROOSEVELT	5232.0	4617.5	3293.0	4547.9
BANKS	715.0	656.1	391.0	618.3

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	0	0	0
Pend Oreille River	9	120	82
Kettle River	2	73	55
Omac Lake, Twin Lakes	0	0	0
Newman Lake	1	54	67

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

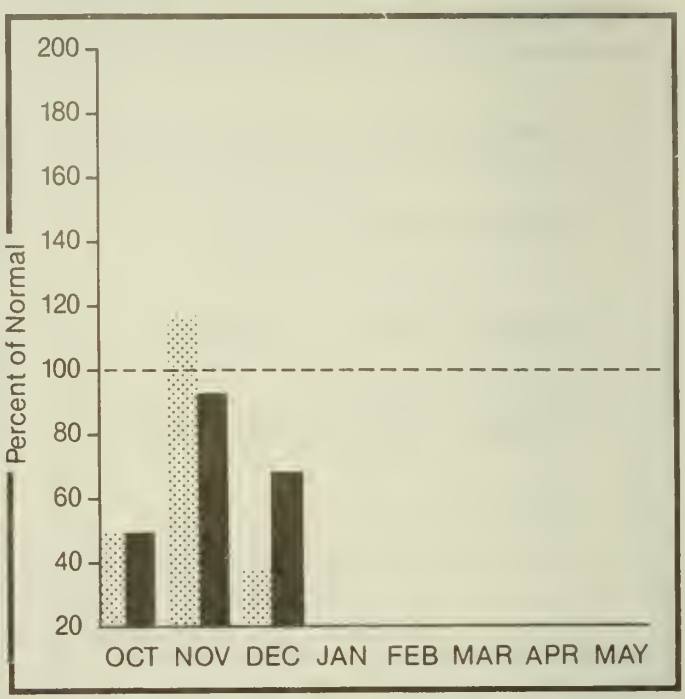
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflow in the Okanogan River was at 101% of average for December. Forecasts for spring and summer on the Okanogan River are for runoff of 91% of normal and 90% on the Methow River. Snow cover as of January 1 is at 74%, based upon SNOTEL data. Manual snow surveys are scheduled for February 1. Precipitation in December was at 38% with water year to date 68% of average. Storage in the Conconully Reservoirs is at 13,400 acre feet which is 57% of capacity.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462	1390	95.	2443	167	337	23.
	APR-JUL	1365	1300	95.	2283	167	317	23.
	APR-JUN	1161	1100	95.	1936	167	264	23.
OKANOGAN R. nr Tonasket	APR-SEP	1644	1500	91.	2700	164	300	18.
	APR-JUL	1497	1360	91.	2453	164	267	18.
	APR-JUN	1262	1150	91.	2071	164	229	18.
METHOW RIVER nr Pateros	APR-SEP	980	880	90.	1213	124	547	56.
	APR-JUL	908	820	90.	1129	124	511	56.
	APR-JUN	773	700	91.	963	125	437	57.

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

RESERVOIR STORAGE (1000AF)

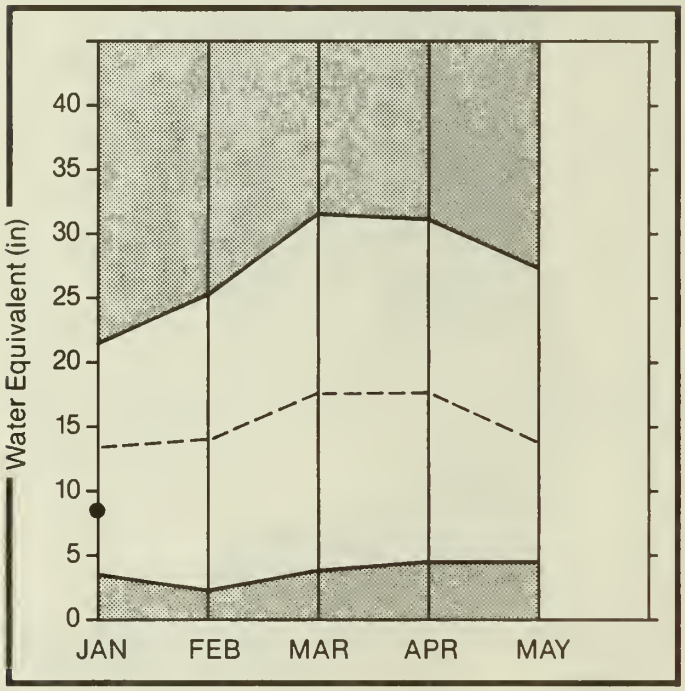
RESERVOIR	USABLE CAPACITY	** USABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CONCONULLY LAKE (SALMON)	10.5	8.0	8.0	7.5
CONCONULLY RESERVOIR	13.0	5.0	5.6	5.9

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Okanogan River	17	102	78
Methow River	2	116	63

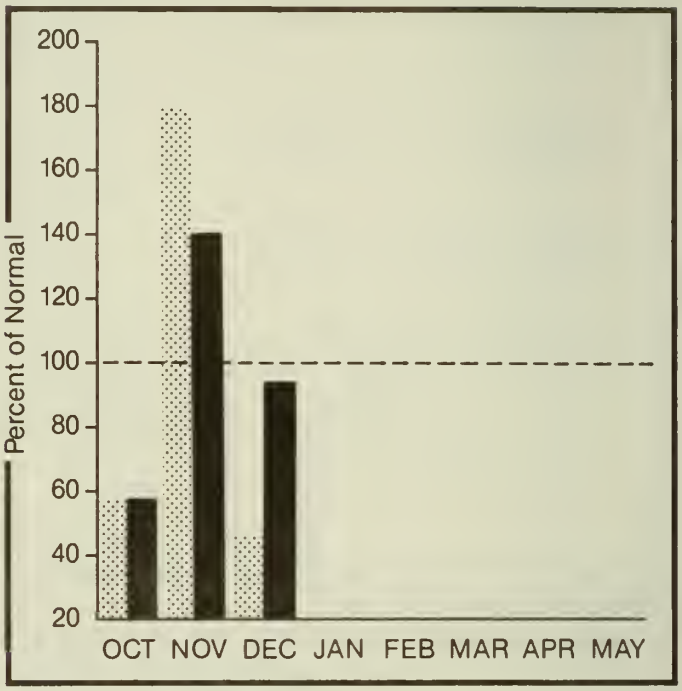
WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Snowpack in the Wenatchee-Chelan Basin is at 86% of normal. Streamflows for December were 65% of average for the Chelan River and 70% on the Wenatchee River. Runoff for spring and summer is forecasted to be 90% of normal in the Wenatchee and 83% in the Chelan Basin. Stehekin River runoff is forecasted to be 85% of average. Precipitation during December was 46% in the Wenatchee and 46% in Chelan. Reservoir storage in Lake Chelan is at 365,000 acre feet or 96% of normal for January 1.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
CHELAN RIVER at Chelan 1	APR-SEP	1203	1000	83.	1349	112	651	54.
	APR-JUL	1055	880	83.	1186	112	574	54.
	APR-JUN	826	660	80.	900	109	420	51.
STEHEKIN R. at Stehekin	APR-SEP	860	730	85.	945	110	515	60.
	APR-JUL	727	620	85.	802	110	438	60.
	APR-JUN	553	470	85.	608	110	332	60.
ENTIAT RIVER nr Ardenvoir	APR-SEP	235	175	75.	234	100	116	49.
	APR-JUL	213	160	75.	213	100	107	50.
	APR-JUN	172	130	76.	173	101	87	51.
WENATCHEE RIVER at Plain	APR-SEP	1270	1140	90.	1597	126	683	54.
	APR-JUL	1113	1000	90.	1401	126	599	54.
	APR-JUN	899	800	89.	1124	125	476	53.
STEMILT nr Wenatchee (miners in)	MAY-SEP	138	110	80.	160	116	60	43.
ICICLE CREEK nr Leavenworth	APR-SEP	370	330	89.	463	125	197	53.
	APR-JUL	340	300	88.	422	124	178	52.
	APR-JUN	270	240	89.	337	125	143	53.
COLUMBIA R. bl Rock Island Dam 2	APR-SEP	72781	64300	88.	81767	112	46833	64.
	APR-JUL	61601	54200	88.	68984	112	39416	64.
	APR-JUN	48384	42600	88.	54212	112	30988	64.

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

RESERVOIR STORAGE (1000AF)

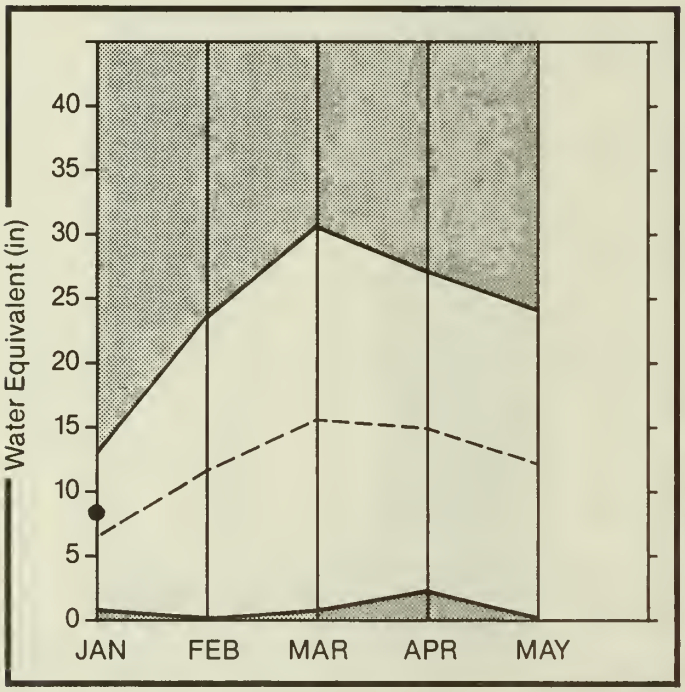
RESERVOIR	USABLE CAPACITY	** USABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CHELAN LAKE	676.1	365.0	365.7	378.7

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	4	143	97
Entiat River	0	0	0
Wenatchee River	6	117	84
Colockum Creek	1	44	69
Squilchuck Creek	0	0	0
Stemilt Creek	0	0	0

YAKIMA

Mountain snowpack* (inches)



*Based on selected stations

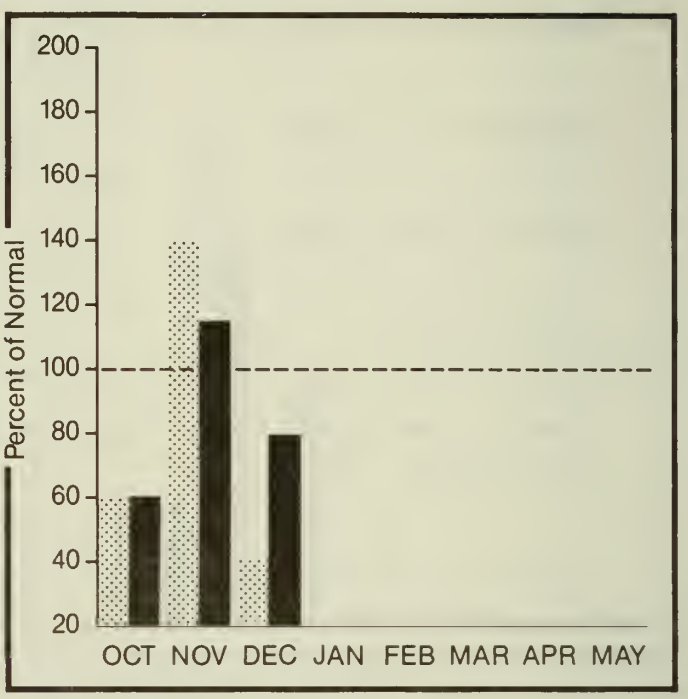
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Reservoir storage continues low, with January 1 values for the five major reservoirs at 337,900 acre feet or 58% of normal. December streamflow was not available due to icing of the stream gage. Forecasts for the Yakima Basin runoff are 84% of normal, and for the Yakima River at Cle Elum 84%, Naches River 85%, the Yakima River at Parker 84% and Ahtanum Creek 83%. Snowpack is 84% of average in the Yakima basin. Precipitation for December was 40% of normal and 79% for the water year to date.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
YAKIMA RIVER at Martin 1	APR-SEP	139	120	86.	158	114	82	59.
	APR-JUL	128	110	86.	136	106	84	66.
	APR-JUN	111	95	86.	114	103	76	68.
YAKIMA RIVER at Cle Elum 2	APR-SEP	943	790	84.	941	100	639	68.
	APR-JUL	854	710	83.	847	99.	573	67.
	APR-JUN	734	620	84.	737	100	503	69.
YAKIMA RIVER nr Parker 2	APR-SEP	2096	1760	84.	2326	111	1194	57.
	APR-JUL	1898	1590	84.	2102	111	1078	57.
	APR-JUN	1667	1400	84.	1850	111	950	57.
KACHESS RIVER nr Easton 1	APR-SEP	121	100	83.	139	115	61	50.
	APR-JUL	115	95	83.	132	115	58	50.
	APR-JUN	101	85	84.	117	116	53	52.
CLE ELUM RIVER nr Roslyn 1	APR-SEP	463	410	89.	516	111	304	66.
	APR-JUL	422	370	88.	450	107	290	69.
	APR-JUN	353	300	85.	367	104	233	66.
BUMPING RIVER nr Nile 1	APR-SEP	142	130	92.	171	120	89	63.
	APR-JUL	129	120	93.	157	122	83	64.
	APR-JUN	107	98	92.	129	121	67	63.
AMERICAN RIVER nr Nile	APR-SEP	124	110	89.	147	119	73	59.
	APR-JUL	113	100	88.	134	119	66	58.
	APR-JUN	94	83	88.	111	118	55	59.
TIETON RIVER at Tieton 1	APR-SEP	246	200	81.	249	101	151	61.
	APR-JUL	207	170	82.	211	102	129	62.
	APR-JUN	165	140	85.	173	105	107	65.
NACHES RIVER nr Naches 2	APR-SEP	867	740	85.	1017	117	463	53.
	APR-JUL	784	670	85.	921	117	419	53.
	APR-JUN	667	570	85.	783	117	357	54.
AHTANUM CREEK nr Tampico 2	APR-SEP	47	39	83.	60	128	18.0	38.
	APR-JUL	43	36	84.	55	128	17.0	40.
	APR-JUN	37	31	84.	48	130	14.0	38.

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

RESERVOIR STORAGE (1000AF)

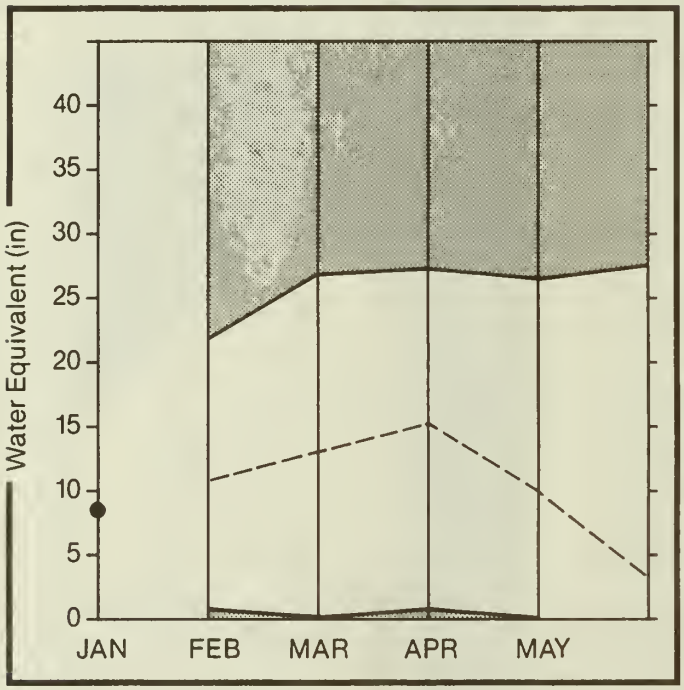
RESERVOIR	USABLE CAPACITY	** USABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
KEECHELUS	157.8	64.2	59.2	83.0
KACHESS	239.0	55.5	98.1	159.1
CLE ELEM	436.9	102.2	118.5	230.2
BUMPING LAKE	33.7	12.4	4.3	6.3
RIMROCK	198.0	103.6	118.8	102.1

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	14	110	83
Ahtanum Creek	2	58	62

WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

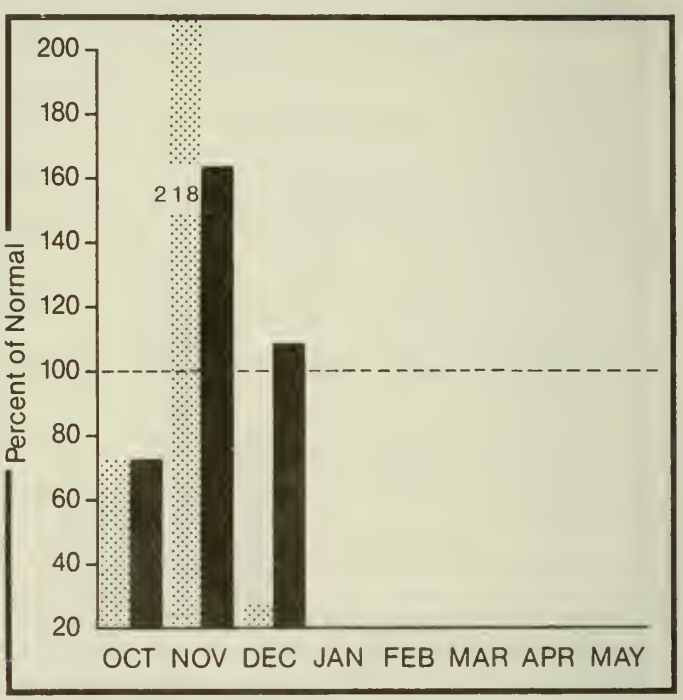
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Snowpack in the Walla Walla River basin is 84% of normal. Precipitation for December was 28% of average and the water year to date precipitation has been 109% of normal. Forecasted streamflow in the Walla Walla Basin is 91% of average. Streamflow for December in the Walla Walla River was 49% of normal.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
MILL CREEK at Walla Walla	APR-SEP	17.5	16.0	91.	22	126	10.0	57.
	APR-JUL	17.3	15.7	91.	22	127	10.0	58.
	APR-JUN	17.2	15.6	91.	22	128	10.0	58.
COLUMBIA R. at The Dalles 2	APR-SEP	101000	84000	83.	110260	109	57740	57.
	APR-JUL	86500	71800	83.	94290	109	49310	57.
	APR-JUN	70100	58200	83.	76426	109	39974	57.

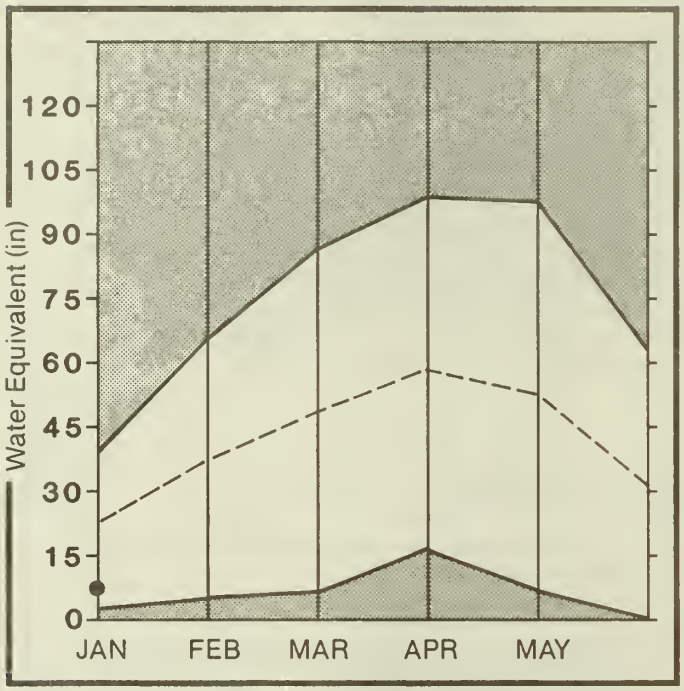
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Mill Creek	1	161	84

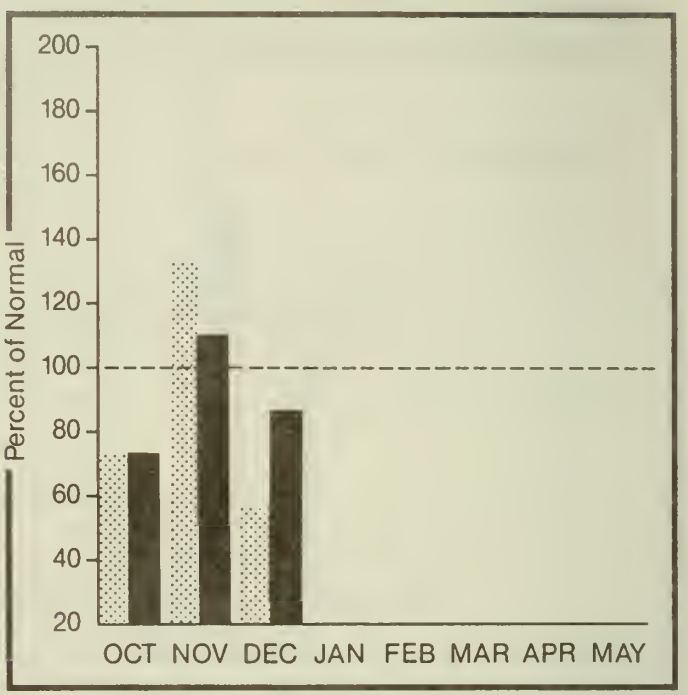
COWLITZ AND LEWIS

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover for the Cowlitz-Lewis Basin is at 77% of normal. This compares to last years 63% at this time. Maximum water content was noted at the Paradise SNOTEL site where the snow pack contained 23.7 inches of water on January 1. Streamflow is forecasted to be near normal for the coming water year. Forecasts for the Lewis River is 88% and for the Cowlitz River 88%. Precipitation was 56% of normal for December. Water year to date precipitation has been 86% of average.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
LEWIS RIVER at Ariel 2	APR-SEP	1249	1100	88.	1625	130	575	46.
	APR-JUL	1086	960	88.	1416	130	504	46.
	APR-JUN	961	850	88.	1254	130	446	46.
COWLITZ R. bl Mayfield Dam 2	APR-SEP	2038	1790	88.	2707	133	873	43.
	APR-JUL	1778	1560	88.	2360	133	760	43.
	APR-JUN	1502	1320	88.	1996	133	644	43.
COWLITZ R. at Castle Rock 2	APR-SEP	2673	2350	88.	3018	113	1682	63.
	APR-JUL	2323	2100	90.	2681	115	1519	65.
	APR-JUN	1980	1750	88.	2245	113	1255	63.

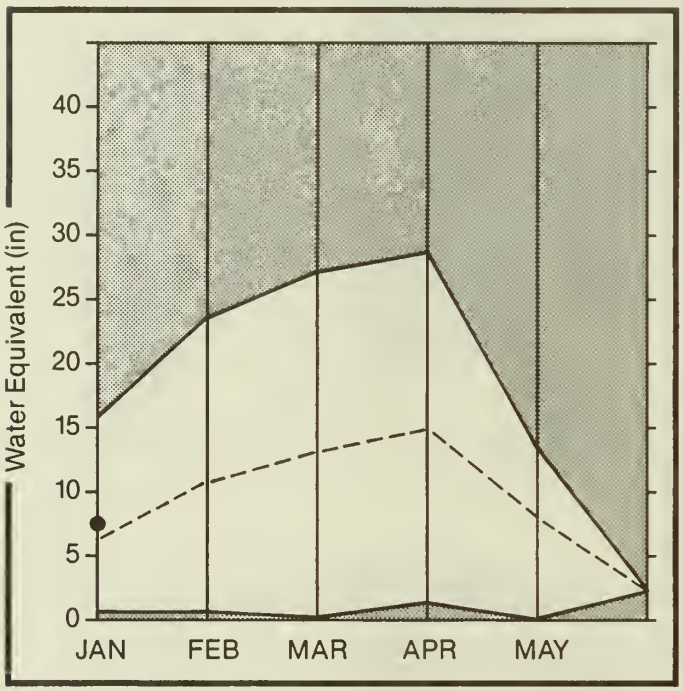
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
Cowlitz River	1	93	68
Lewis River	4	92	78

WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

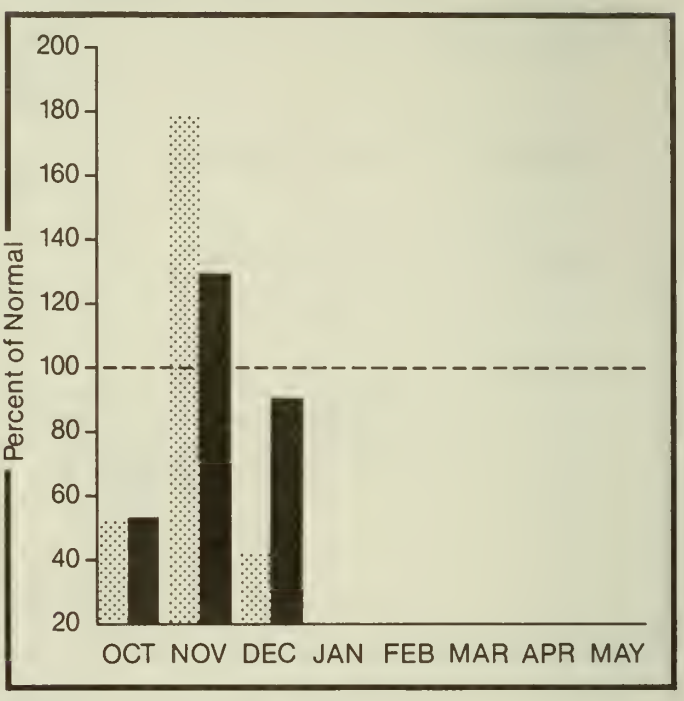
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

Summer runoff is forecasted to be 82% of normal on the Green River and 86% on the Cedar River. Water content at the Stampede Pass SNOTEL site showed 21.1 inches of water content on January 1. December runoff was near 60% of average. Precipitation was 41% of normal for December, bringing the water year to date to 91% of average. Snowpack is 74% of normal for the basin.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
GREEN RIVER bl Howard Hanson Dam 2	APR-SEP	316	260	82.	371	117	149	47.
	APR-JUL	284	240	85.	339	119	141	50.
	APR-JUN	256	210	82.	300	117	120	47.
CEDAR RIVER nr Cedar Falls	APR-SEP	93	80	86.	113	122	47	51.

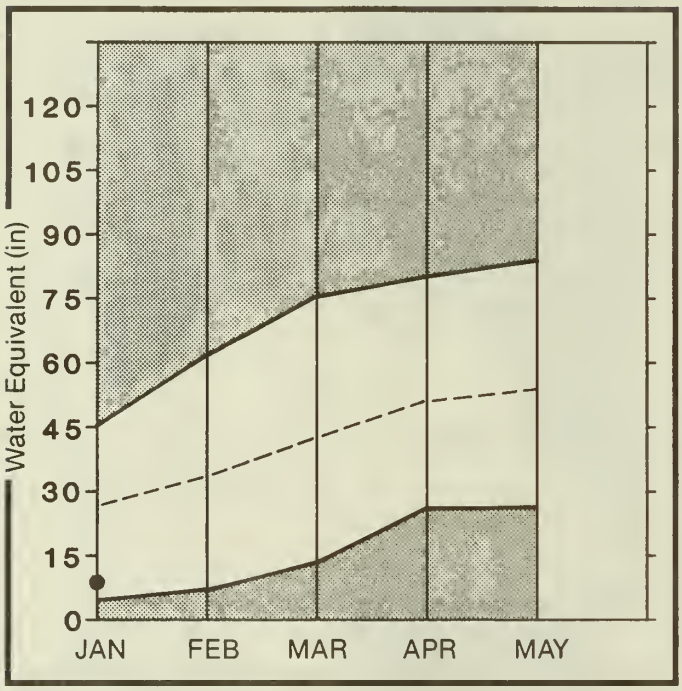
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage. The average is computed for the 1961-85 base period.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERACE
White River	2	150	116
Green River	7	122	86

NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

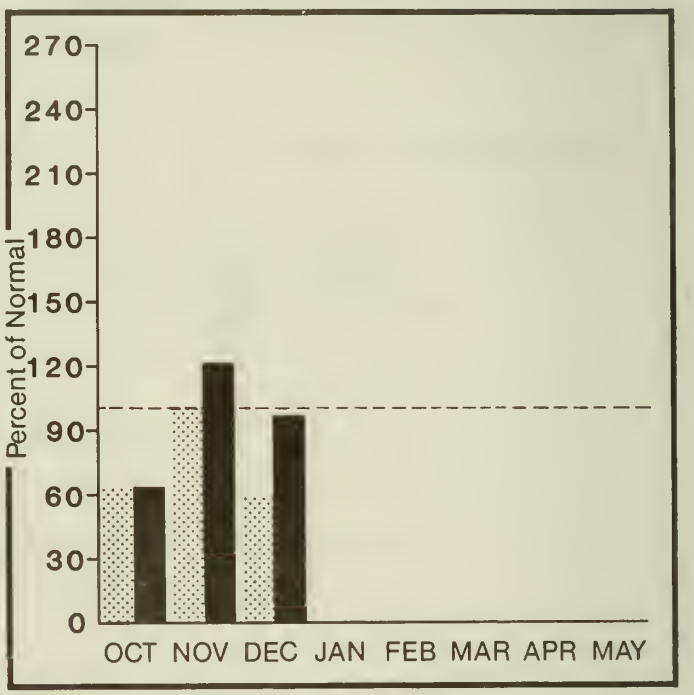
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover for the North Puget Basin is 71% of normal, with the Harts Pass SNOTEL site having 19.1 inches of water content as of January 1. Precipitation values for December were 58% of average, with a water year to date at 95%. Forecasted runoff for the Skagit River is 94% of normal. Reservoir storage is below average with Ross storing 1,178,700 acre feet as of January 1, compared to last years 1,206,000 acre feet.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
SKAGIT RIVER at Newhalem 2	APR-SEP	2356	2210	94.	2823	120	1597	68.
	APR-JUL	1972	1850	94.	2363	120	1337	68.
	APR-JUN	1485	1400	94.	1786	120	1014	68.

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

RESERVOIR STORAGE (1000AF)

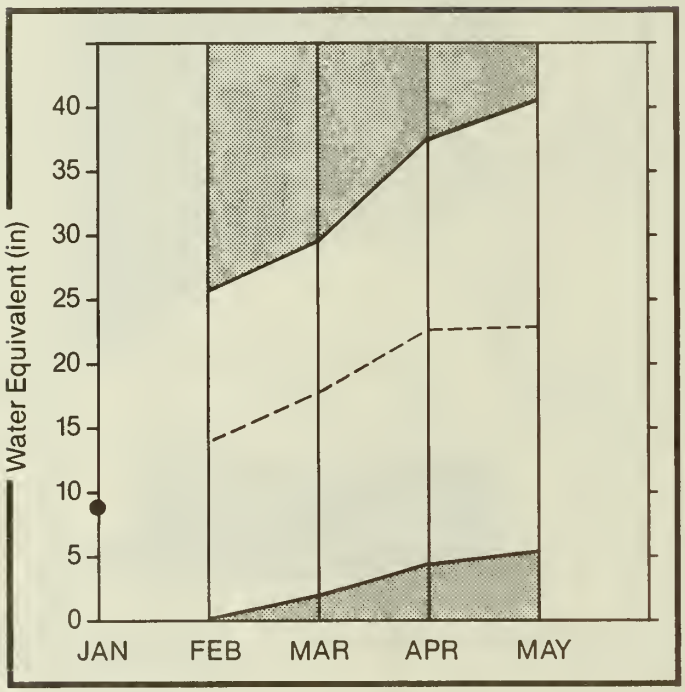
RESERVOIR	USABLE CAPACITY	** USABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ROSS	1404.1	1178.7	1096.0	783.9
DIABLO RESERVOIR	90.6	84.6	84.8	----
GORGE RESERVOIR	9.8	8.0	7.6	----

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
Skagit River	3	131	78
Baker River	0	0	0
Cedar River	0	0	0
Snoqualmie River	0	0	0
Skykomish River	2	128	88

OLYMPIC

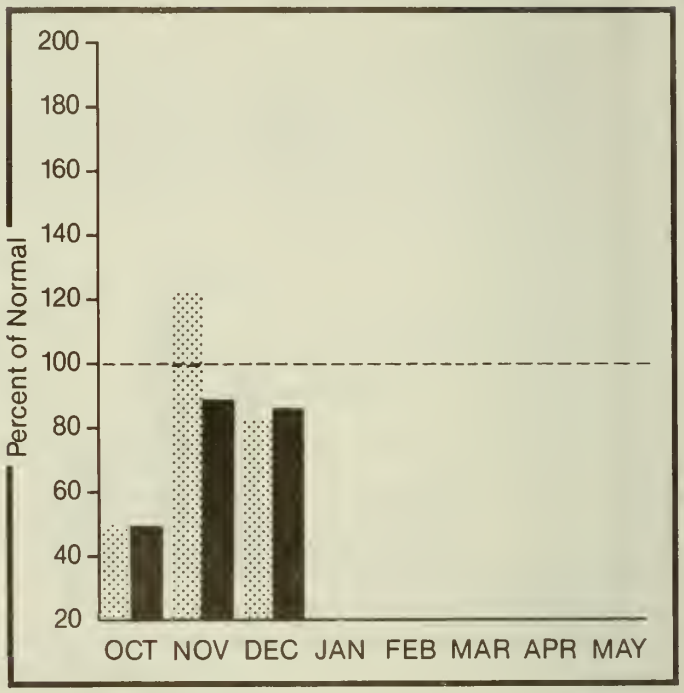
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

December precipitation was 82% of normal. The water year to date accumulation is 86% of average. Snow cover is estimated to be 90% of normal based upon snow pillow data from Carrol Pass on the Wynoochee River. Area streamflow was below normal during December. Forecasts of runoff for the Dungeness River is 90% of average and on the Elwha River 90%.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST	FCST PERIOD	25YR AVG KAF	MOST PROB KAF	MOST PROB %AVG	RMX KAF	RMX % AVG	RMN KAF	RMN % AVG
DUNGENESS RIVER nr Sequim	APR-SEP	160	144	90.	176	110	112	70.
	APR-JUL	130	117	90.	143	110	91	70.
	APR-JUN	97	87	90.	106	109	68	70.
ELWHA RIVER nr Port Angeles	APR-SEP	553	500	90.	611	110	389	70.
	APR-JUL	454	410	90.	501	110	319	70.

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
Dungeness River	0	0	0
Morse Creek	0	0	0
Elwha River	0	0	0

DATA CURRENT AS OF: 1/ 9/87 11:58:48

BASIN SUMMARY OF
SNOW COURSE DATA
JANUARY 1987

SNOW COURSE		ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
PEND OREILLE RIVER							
BENTON MEADOW		2370	12/30/86	6	1.2	2.2	3.0
BENTON SPRING		4920	12/30/86	26	6.4	5.1	8.6
HEART LAKE TRAIL		4800	12/28/87	27	6.7	6.9	9.2
HODODD BASIN		6050	12/28/86	56	17.8	16.7	21.5
HOODDD CREEK		5900	12/28/86	48	14.6	12.6	19.1
LODKOUT		5140	1/05/87	50	13.6	10.5	14.5
NELSON	CAN.	3100	1/07/87	35	8.3	4.4	7.2
SCHWEITZER BOWL		4800	12/29/86	39	10.4	6.8	13.8
SCHWEITZER RIDGE		6200	12/29/86	52	17.9	15.7	21.3
COLVILLE RIVER							
KETTLE RIVER							
BIG WHITE MTN	CAN.	5510	12/30/86	31	5.9	7.3	7.2
FARRON	CAN.	4000	12/30/86	22	3.5	5.6	9.9
OMAK LAKE, TWIN LAKES							
SPOKANE RIVER							
ABOVE BURKE		4100	1/05/87	34	8.0	5.6	8.4
LODKOUT		5140	1/05/87	50	13.6	10.5	14.5
LOST LAKE		6110	12/31/86	65	20.2	17.2	25.2
MOSQUITO RIDGE		5200	1/01/87	---	12.5E	--	17.1
SHERWIN		3200	1/02/87	19	3.7	3.9	5.6
SUNSET		5540	1/01/87	---	12.1E	--	14.7
NEWMAN LAKE							
RAGGED RIDGE		3330	12/30/86	13	2.6	4.8	3.9

SNOW COURSE		ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
OKANOGAN RIVER							
BLACKWALL PEAK	CAN.	6370	12/30/86	54	17.0	11.6	14.8
BRENDA MINE	CAN.	4800	12/29/86	23	5.2	4.2	6.5
BROOKMERE	CAN.	3200	1/01/87	22	5.7	.9	4.6
ENDERBY	CAN.	6200	12/30/86	67	17.5	19.7	18.6
GREYBACK RES	CAN.	5120	12/30/86	17	3.0	4.4	3.1
HAMILTON HILL	CAN.	4890	12/29/86	24	4.2	4.7	8.4
HARTS PASS	FILLDW	6500	1/01/87	---	19.1S	15.4	27.2
ISINTOK LAKE	CAN.	5500	12/26/86	10	2.4	3.4	3.5
LOST HORSE MTN	CAN.	6300	12/31/86	17	3.8	3.5	4.7
MCCULLOCH	CAN.	4200	12/31/86	14	2.3	2.8	3.2
MISSION CREEK	CAN.	5800	12/30/86	29	6.5	9.7	8.9
MT. KOBAU	CAN.	5900	12/28/86	13	2.8	3.9	6.3
SALMON MOWS	FILLOW	4500	1/01/87	---	2.3S	3.1	7.0
SILVER STAR MTN	CAN.	6000	12/28/86	38	10.5	13.2	13.4
SUMMERLAND RES	CAN.	4200	12/28/86	15	3.3	3.7	4.5
VASEUX CREEK	CAN.	4600	12/29/86	8	1.4	2.5	2.7
WHITE ROCKS MTN	CAN.	6000	12/30/86	33	9.3	6.9	11.6
METHOW RIVER							
HARTS PASS	FILLDW	6500	1/01/87	---	19.1S	15.4	27.2
SALMON MOWS	FILLOW	4500	1/01/87	---	2.3S	3.1	7.0
CHELAN LAKE BASIN							
LYMAN LAKE	FILLDW	5900	1/01/87	---	27.1S	20.0	28.3
MIRROR LAKE	FILLOW	5600	1/01/87	---	17.4S	11.5	14.1
PARK CK RIDGE	FILLDW	4600	1/01/87	---	24.4S	15.8	20.6
RAINY PASS	FILLOW	4780	1/01/87	---	14.9S	11.2	23.2
ENTIAT RIVER							
WENATCHEE RIVER							
BERNE-MILL CREEK		3170	12/30/D6	46	10.4	7.9	11.7
BLEWETT PASS#2	FILLOW	4270	1/01/87	---	5.9S	9.1	11.5
LYMAN LAKE	FILLOW	5900	1/01/87	---	27.1S	20.0	28.3
MERRITT		2140	12/30/86	25	4.3	6.4	7.5
STEVENS PASS	FILLOW	4070	1/01/87	---	20.0S	15.5	18.9
STEVENS PASS	SAND SD	3700	12/30/86	59	13.8	11.0	19.3

SNOW COURSE		ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
COLDCKUM CREEK							
TROUGH #2	FILLDW	5310	1/01/87	---	3.5E	7.9	5.1
SQUILCHUCK CREEK							
STEMILT CREEK							
YAKIMA RIVER							
AHTANUM R.S.		3100	12/29/86	14	2.6	6.4	3.6
BIG BOULDER CREEK		3200	12/31/86	34	6.6	5.7	7.2
BLEWETT PASS#2	FILLDW	4270	1/01/87	---	5.9S	9.1	11.5
BUMPING LAKE		3450	12/29/86	22	3.8	5.2	6.5
BUMPING LAKE (NEW)		3400	12/29/86	27	4.8	5.8	8.0
CORRAL PASS	FILLDW	6000	1/01/87	---	22.5E	13.7	15.5
FISH LAKE	FILLDW	3370	1/01/87	---	12.9S	8.6	15.1
GREEN LAKE	FILLDW	6000	1/01/87	---	5.0S	6.8	8.7
GROUSE CAMP	FILLDW	5380	1/01/87	---	4.5S	8.5	9.0
MORSE LAKE	FILLDW	5400	1/01/87	---	21.1S	15.3	22.0
STAMPEDE PASS	FILLDW	3860	1/01/87	---	21.1S	13.7	23.6
SASSE RIDGE	FILLDW	4200	1/01/87	---	11.9S	10.1	15.4
WHITE PASS ES	FILLDW	4500	1/01/87	---	7.1S	7.6	10.4
AHTANUM CREEK							
AHTANUM R.S.		3100	12/29/86	14	2.6	6.4	3.6
GREEN LAKE	FILLDW	6000	1/01/87	---	5.0S	6.8	8.7
MILL CREEK							
HIGH RIDGE	FILLDW	4980	1/01/87	---	10.3S	6.4	12.2
LEWIS AND CLARK RIVERS							
WHITE PASS ES	FILLOW	4500	1/01/87	---	7.1S	7.6	10.4

SNOW COURSE		ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
WHITE RIVER							
CORRAL PASS	FILLDW	6000	1/01/87	---	22.5E	13.7	15.5
MORSE LAKE	FILLDW	5400	1/01/87	---	21.1S	15.3	22.0
GREEN RIVER							
COUGAR MTN.	FILLDW	3200	1/01/87	---	7.0S	6.7	11.2
GRASS MOUNTAIN #2		2900	1/05/87	12	3.8	2.7	5.4
LESTER CREEK		3100	1/05/87	30	4.5	7.2	8.6
LYNN LAKE		4000	1/05/87	24	7.0	10.2	7.8
SAWMILL RIDGE		4700	1/05/87	48	14.9	7.1	14.1
STAMPEDE PASS	FILLDW	3860	1/01/87	---	21.1S	13.7	23.6
TWIN CAMP		4100	1/05/87	42	11.4	9.5	10.3
CEDAR RIVER							
SNOQUALMIE RIVER							
SKYKOMISH RIVER							
STEVENS PASS	FILLDW	4070	1/01/87	---	20.0S	15.5	18.9
STEVENS PASS	SAND SD	3700	12/30/86	59	13.8	11.0	19.3
SKAGIT RIVER							
HARTS PASS	FILLDW	6500	1/01/87	---	19.1S	15.4	27.2
LYMAN LAKE	FILLDW	5900	1/01/87	---	27.1S	20.0	28.3
RAINY PASS	FILLDW	4780	1/01/87	---	14.9S	11.2	23.2
BAKER RIVER							
DUNGENESS RIVER							

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
  Corps of Engineers
U.S. Department of Agriculture
  Forest Service
U.S. Department of Commerce
  NOAA, National Weather Service
U.S. Department of the Interior
  Bonneville Power Administration
  Bureau of Reclamation
  Geological Survey
  National Park Service
  Bureau of Indian Affairs

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
Colville Confederated Tribes

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-2000 LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

SOIL CONSERVATION SERVICE

☆ GPO 1983 696-712

551.573
In36WWa

United States
Department of
Agriculture

**Soil
Conservation
Service**

Spokane,
Washington

Washington Water Supply Outlook

FEBRUARY 1, 1987

The Library of the
MAR 13 1987
University of Illinois
at Urbana-Champaign

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Denver, CO 80211
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 97102
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97208
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA are available to everyone without regard to race, creed, color, sex, age, handicap or national origin.

TABLE OF CONTENTS

STATE STREAMFLOW PROSPECTS MAP 1

STATE GENERAL OUTLOOK 2

BASIN OUTLOOK AND CONDITIONS

- SPOKANE 4
- COLVILLE AND PEND OREILLE 6
- OKANOGAN AND METHOW 8
- WENATCHEE AND CHELAN 10
- YAKIMA 12
- WALLA WALLA 14
- COWLITZ AND LEWIS 16
- WHITE - GREEN 18
- NORTH PUGET SOUND 20
- OLYMPIC 22

SNOW DATA 24

ADDITIONAL INFORMATION 26

U S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

February 1, 1987

STREAMFLOW PROSPECTS WASHINGTON

SOURCE: Data compiled by SCS Field Personnel.

JANUARY 1986 4 R 39641

BASE 4 R 39260

GENERAL OUTLOOK

SUMMARY:

February Washingon water supply forecasts indicate below normal runoff for 1987, but Western Washington and the east side of the Cascade mountains show improvements from January. Snow cover and precipitation continue to be below average. Reservoir storage is below normal at the major irrigation projects throughout the state. January streamflows were below average. Note: The Colville snow cover graph has been corrected for the January reading.

SNOWPACK:

Feburary snow pack is low with a state wide average of 85%. Eastern Washington is the lowest with the Spokane Basin coming in at 69% of normal. The eastern slopes of the Cascade mountains are a little better with the Wenatchee Basin at 87%,the Chelan Basin at 80% and the Yakima Basin at 90% of average. The west side of the state also showed improvement over the January 1 snow measurements with the Cowlitz at 97% and the Skagit at 90% of normal.

PRECIPITATION:

January precipitation values from SNOTEL sites indicate a water year value near 82% of average for the high mountain areas. Precipitation data from the National Weather Service sites show January with much below average in the Spokane Basin at 51% and the Pend Oreille Basin 61%. The west side basins fared much better for January with the Cowlitz at 104% and the Olympic Peninsula at 105% of normal. Water year to date precipitation is below average over the entire state and varies from 99%for the Walla Walla Basin to 55% for the Colville.

RESERVOIRS:

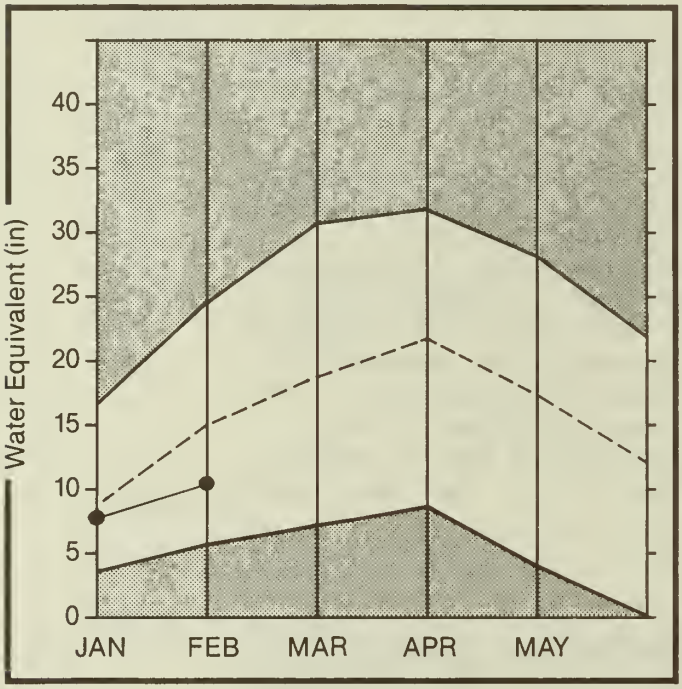
Major irrigation reservoir storage remains below average in Washington for January. The Yakima Basin which relies heavily upon stored water for irrigation is at 62% of average, with storage as of February 1 at 355,000 acre feet. Columbia River reservoirs are near normal with Roosevelt at 126% of normal. Storage in the Okanogan area improved to 99% of capacity for the Conconully Reservoirs. The power reservoirs such as Coeur d' Alene at 40%, Chelan Lake at 58% and Ross Lake at 93% of average are suffering from low flows of last fall and winter.

STREAMFLOW:

Improved outlook for streamflows are forecasted for the western portion of Washington State. Although still below normal over the entire state the forecasts are better than the January 1. Forecasts vary from 60% in the Spokane River to 100% in the Lewis River. January streamflows continued the summer and fall trend of below normal with only the Kettle River at 109% being above average (may be affected by ice). Other January streamflows are; Spokane at Long Lake 67% (not corrected for upstream storage), Pend Oreille River 55%, Columbia River at the International Boundary 77%, Chelan 65%, Skagit 63%, and the Chehalis River 67%. Flooding occured along some of the coastal streams near the end of January, as rain storms and a high tide made rivers rise.

SPOKANE

Mountain snowpack* (inches)



*Based on selected stations

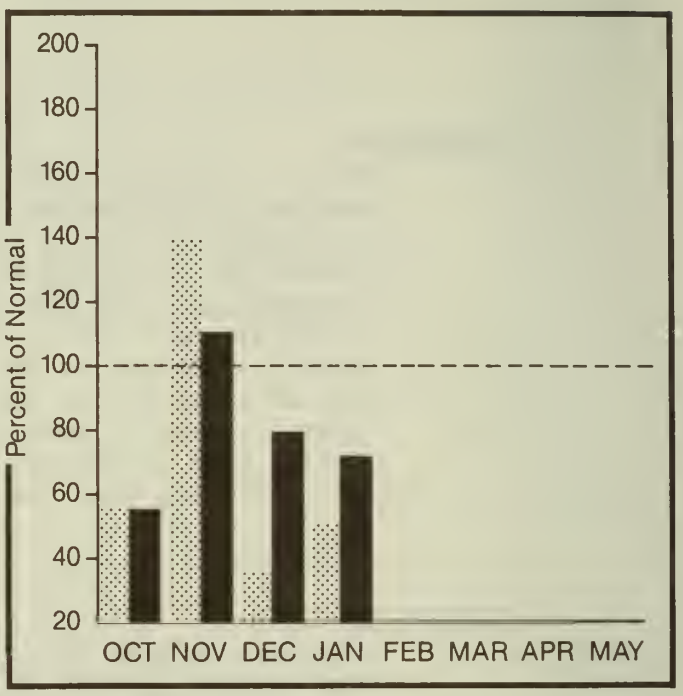
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

January streamflow on the Spokane River continued to be below average at 76% at Long Lake, uncorrected for change of storage in Coeur d' Alene Lake. Forecasted spring and summer runoff is 60% of normal. This forecast is based upon a snowpack that is 70% of average and a water year to date precipitation value of 71% of normal. Data for snow cover was obtained from 15 SNOTEL and manual snow courses. Storage in Coeur d' Alene Lake was 88,200 acre feet compared to 125,400 last year; average storage in Cd'A for February 1 is 220,900 acre feet. Temperatures for Spokane for January were 1 degree above normal.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SPOKANE at Post Falls	APR-SEP	2848.0	1720.0	60	3201.0	112	239.0	8
	APR-JUL	2754.0	1660.0	60	3092.0	112	228.0	8

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
COEUR D'ALENE	291.2	88.2	125.4	220.9

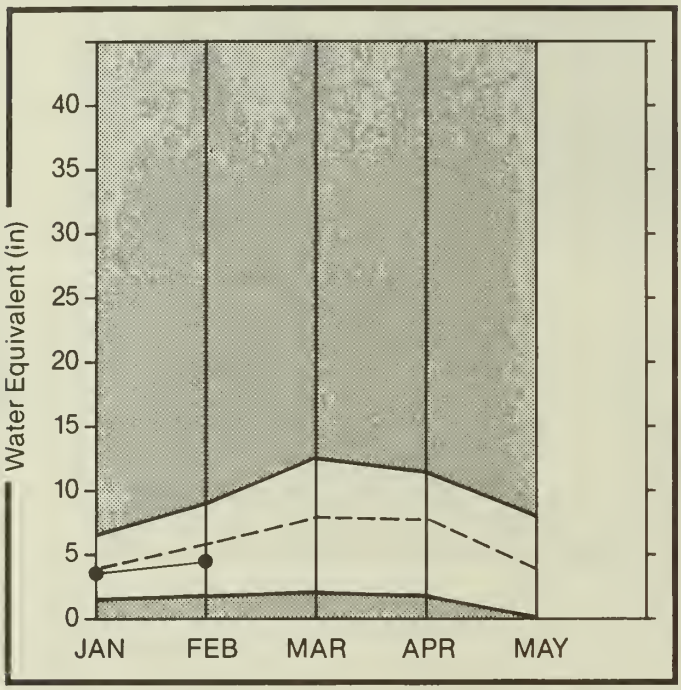
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
Spokane River	15	98	69

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

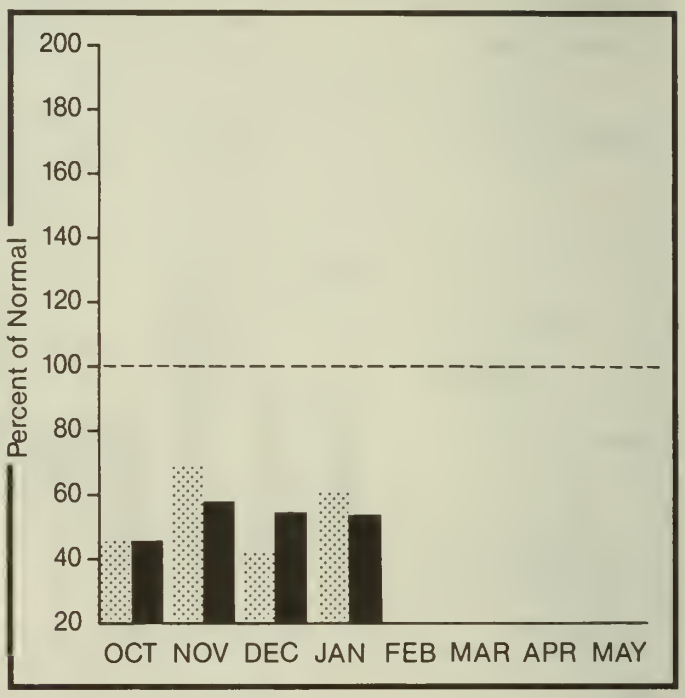
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflows for January were 75% of average on the Pend Oreille River, 109% on the Kettle River and 77% on the Columbia River at the International Boundary. Streamflows for the Pend Oreille River is forecasted to be 75%, Kettle River 80% and the Colville River 81% of normal for the spring and summer runoff period. Snowpack measurements in the Pend Oreille Basin are at 73% of normal based on nine snow course measurements. Basin-wide the snow cover is at 76% of average and 80% of last year. Precipitation during January was 61% of average bringing the water year to date to 55% of normal.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	11500.0	75	15200.0	99	7800.0	51
	APR-JUL	14156.0	10600.0	75	14000.0	99	7200.0	51
	APR-JUN	12227.0	9170.0	75	12100.0	99	6240.0	51
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	108.0	81	175.0	131	41.0	31
	APR-JUL	123.0	99.0	80	161.0	131	38.0	31
	APR-JUN	114.0	92.0	81	149.0	131	35.0	31
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1460.0	80	2521.0	138	399.0	22
	APR-JUL	1738.0	1380.0	79	2390.0	138	370.0	21
	APR-JUN	1581.0	1270.0	80	2190.0	139	355.0	22
COLUMBIA RIVER at Birchbank 2	APR-SEP	44605.0	39200.0	88	46800.0	105	31600.0	71
	APR-JUL	35705.0	31400.0	88	37500.0	105	25300.0	71
	APR-JUN	26027.0	22900.0	88	27300.0	105	18500.0	71
COLUMBIA RIVER at Grand Coulee 2	APR-SEP	66841.0	54700.0	82	67400.0	101	42000.0	63
	APR-JUL	56169.0	46100.0	82	56800.0	101	35400.0	63
	APR-JUN	44036.0	36100.0	82	44500.0	101	27700.0	63

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVG.
ROOSEVELT	5232.0	4712.5	5014.1	3749.0
BANKS	715.0	658.7	391.0	599.0

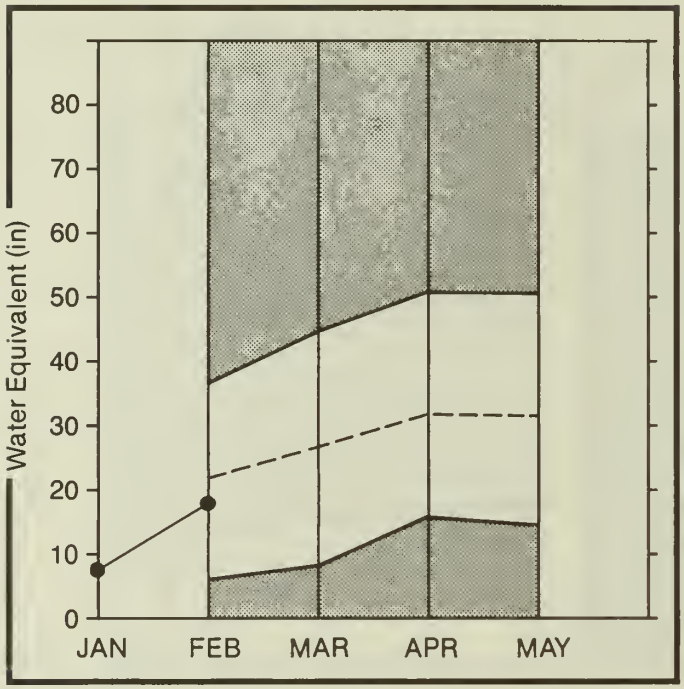
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	1	71	73
Pend Oreille River	9	101	73
Kettle River	7	84	76
Omac Lake, Twin Lakes	0	0	0
Newman Lake	0	0	0

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

OKANOGAN AND METHOW

Mountain snowpack* (inches)



*Based on selected stations

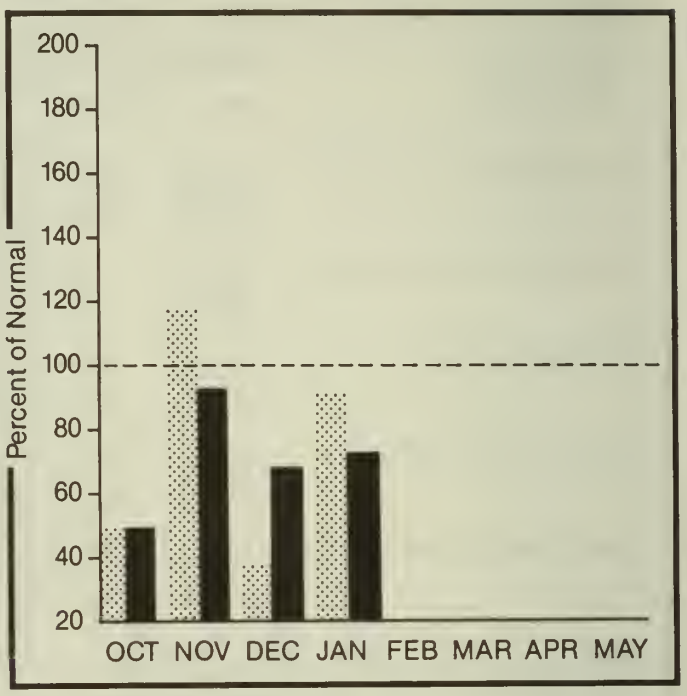
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Spring and summer forecasts on the Okanogan River is for runoff of 78% of normal and 79% on the Methow River. Streamflow in the Okanogan River was at 81% of average for January. Snow cover as of February 1 is 79% on the Okanogan, based upon data from 22 snow course measurements. Snow cover is 67% on the Methow. January precipitation in the Okanogan was at 92% with water year to date 73% of average. Storage in the Conconully Reservoirs is at 13,700 acre feet which is 59% of capacity and 99% of average. Temperatures for January were 5 degrees above normal.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1120.0	77	1700.0	116	535.0	37
	APR-JUL	1365.0	1050.0	77	1600.0	117	505.0	37
	APR-JUN	1161.0	895.0	77	1360.0	117	430.0	37
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1290.0	78	2100.0	128	485.0	30
	APR-JUL	1497.0	1170.0	78	1900.0	127	435.0	29
	APR-JUN	1262.0	985.0	78	1600.0	127	365.0	29
METHOW RIVER nr Pateros	APR-SEP	980.0	780.0	80	1200.0	122	360.0	37
	APR-JUL	908.0	720.0	79	1110.0	122	330.0	36
	APR-JUN	773.0	610.0	79	940.0	122	280.0	36

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
CONCONULLY LAKE (SALMON)	10.5	8.0	8.0	7.5
CONCONULLY RESERVOIR	13.0	5.7	6.0	6.3

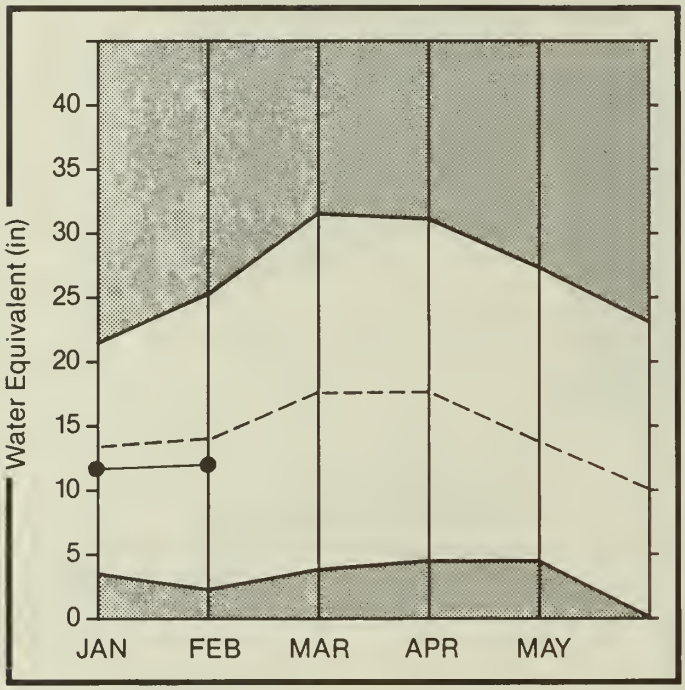
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
Okanogan River	25	92	77
Methow River	4	91	60

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

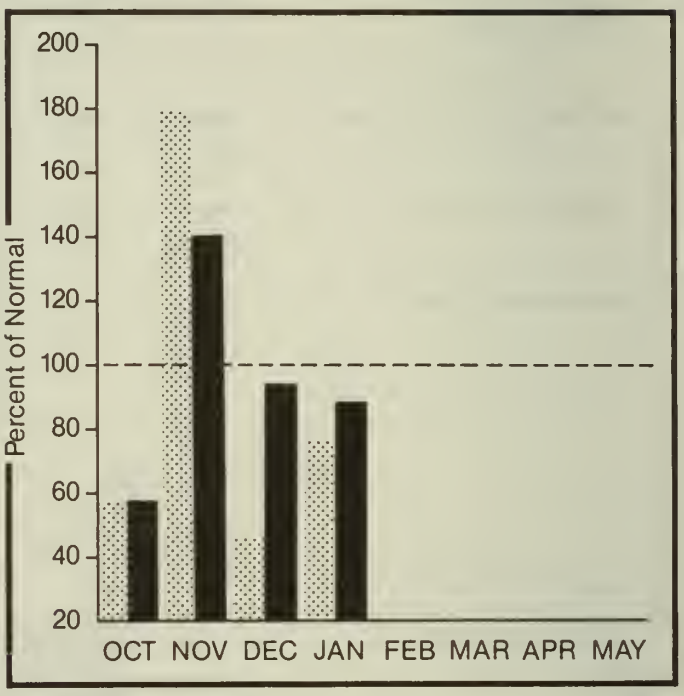
WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

January streamflows were 65% of average for the Chelan River and 50% on the Wenatchee River. Snowpack in the Wenatchee Basin is at 87% of normal, while the Chelan is at 75% and the Entiat at 84%. Spring and summer runoff for the Wenatchee is forecast to be 87% of normal, down from the 90% from last month, and 82% in the Chelan Basin, down from 83%. Stehekin River runoff is forecast to be 83% of average. Stemilt and Icicle are forecast at 81%. January precipitation was 78% of normal in the basin and 87% for the water year to date. Reservoir storage in Lake Chelan is at 260,500 acre feet or 58% of normal for February 1.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
CHELAN RIVER at Chelan 1	APR-SEP	1203.0	985.0	82	1290.0	107	685.0	57
	APR-JUL	1055.0	865.0	82	1130.0	107	600.0	57
	APR-JUN	826.0	680.0	82	890.0	108	475.0	58
STEHEKIN R. at Stehekin	APR-SEP	860.0	710.0	83	880.0	102	540.0	63
	APR-JUL	727.0	600.0	83	745.0	102	455.0	63
	APR-JUN	553.0	460.0	83	570.0	103	350.0	63
ENTIAT RIVER nr Ardenvoir	APR-SEP	234.6	188.0	80	245.0	104	130.0	55
	APR-JUL	213.0	171.0	80	225.0	106	118.0	55
	APR-JUN	172.0	138.0	80	181.0	105	95.0	55
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1110.0	87	1540.0	121	680.0	54
	APR-JUL	1113.0	970.0	87	1350.0	121	590.0	53
	APR-JUN	899.0	785.0	87	1090.0	121	480.0	53
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	113.0	82	160.0	116	66.0	48
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	300.0	81	425.0	115	174.0	47
	APR-JUL	340.0	275.0	81	390.0	115	159.0	47
	APR-JUN	270.0	220.0	81	310.0	115	128.0	47
COLUMBIA R. bl Rock Island Dam 2	APR-SEP	72781.0	60300.0	83	74100.0	102	46500.0	64
	APR-JUL	61601.0	51100.0	83	62800.0	102	39400.0	64
	APR-JUN	48384.0	40200.0	83	49400.0	102	31000.0	64

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
CHELAN LAKE	676.1	260.5	267.5	450.6

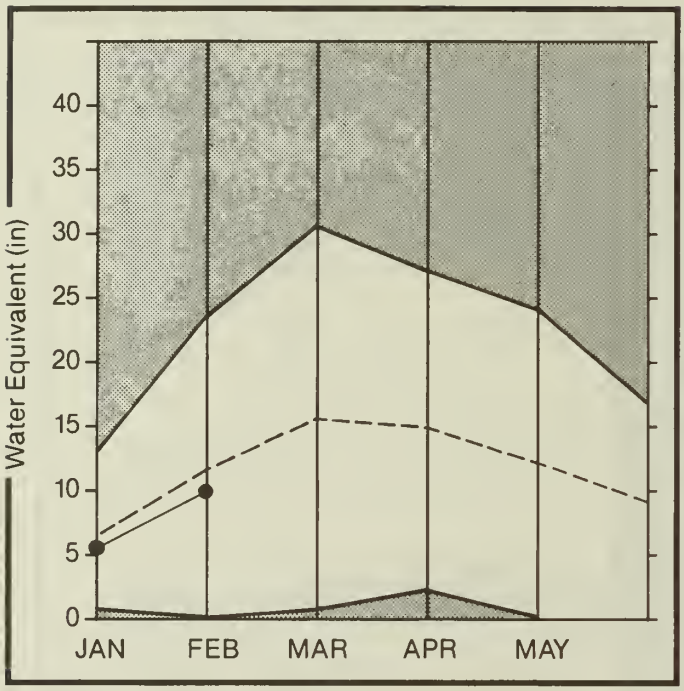
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	6	82	75
Entiat River	2	97	103
Wenatchee River	7	125	99
Colockum Creek	1	67	67
Squilchuck Creek	0	0	0
Stemilt Creek	2	63	71

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

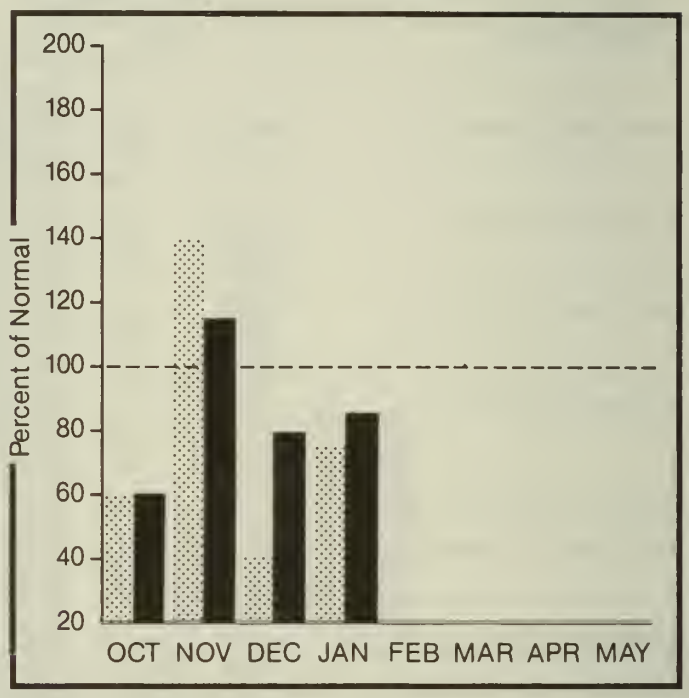
YAKIMA

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Improved forecasts for the Yakima Basin call for runoff 86% of normal. These vary throughout the basin as follows; for the Yakima River at Cle Elum 86%, Naches River 83%, the Yakima River at Parker 84% and Ahtanum Creek 81%. Reservoir storage remains below average with February 1 values for the five major reservoirs at 354,500 acre feet or 62% of normal. Streamflow for January was not available due to icing of the stream gage. Snowpack is 90% of average in the Yakima Basin based upon measurements at 19 snow courses. Precipitation for January was 76% of normal and 85% for the water year to date. Temperatures were average for January.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
YAKIMA RIVER at Martin 1	APR-SEP	139.0	122.0	88	141.0	101	103.0	74
	APR-JUL	128.0	113.0	88	131.0	102	95.0	74
	APR-JUN	111.0	98.0	88	114.0	103	82.0	74
YAKIMA RIVER at Cle Elum 2	APR-SEP	943.0	810.0	86	942.0	100	678.0	72
	APR-JUL	854.0	735.0	86	855.0	100	615.0	72
	APR-JUN	734.0	630.0	86	733.0	100	527.0	72
YAKIMA RIVER nr Parker 2	APR-SEP	2096.0	1760.0	84	2300.0	110	1220.0	58
	APR-JUL	1898.0	1590.0	84	2080.0	110	1100.0	58
	APR-JUN	1667.0	1400.0	84	1830.0	110	970.0	58
KACHESS RIVER nr Easton 1	APR-SEP	121.0	103.0	85	124.0	102	82.0	68
	APR-JUL	115.0	98.0	85	118.0	103	78.0	68
	APR-JUN	101.0	86.0	85	103.0	102	69.0	68
CLE ELUM RIVER nr Roslyn 1	APR-SEP	463.0	395.0	85	464.0	100	326.0	70
	APR-JUL	422.0	360.0	85	423.0	100	297.0	70
	APR-JUN	353.0	300.0	85	353.0	100	247.0	70
BUMPING RIVER nr Nile 1	APR-SEP	142.0	118.0	83	155.0	109	81.0	57
	APR-JUL	129.0	107.0	83	141.0	109	73.0	57
	APR-JUN	107.0	89.0	83	117.0	109	61.0	57
AMERICAN RIVER nr Nile	APR-SEP	124.0	103.0	83	134.0	108	72.0	58
	APR-JUL	113.0	94.0	83	122.0	108	66.0	58
	APR-JUN	94.0	78.0	83	102.0	109	55.0	59
TIETON RIVER at Tieton 1	APR-SEP	246.0	205.0	83	269.0	109	141.0	57
	APR-JUL	207.0	173.0	84	227.0	110	119.0	57
	APR-JUN	165.0	137.0	83	180.0	109	94.0	57
NACHES RIVER nr Naches 2	APR-SEP	867.0	720.0	83	963.0	111	477.0	55
	APR-JUL	784.0	650.0	83	870.0	111	430.0	55
	APR-JUN	667.0	555.0	83	742.0	111	368.0	55
AHTANUM CREEK nr Tampico 2	APR-SEP	47.0	38.0	81	57.0	121	19.0	40
	APR-JUL	43.0	34.0	79	51.0	119	17.0	40
	APR-JUN	37.0	30.0	81	45.0	122	15.0	41

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
KEECHELUS	157.8	65.9	62.4	96.0
KACHESS	239.0	62.2	107.0	170.0
CLE ELEM	436.9	106.6	129.4	251.0
BUMPING LAKE	33.7	11.5	8.2	9.0
RIMROCK	198.0	107.0	129.5	115.0

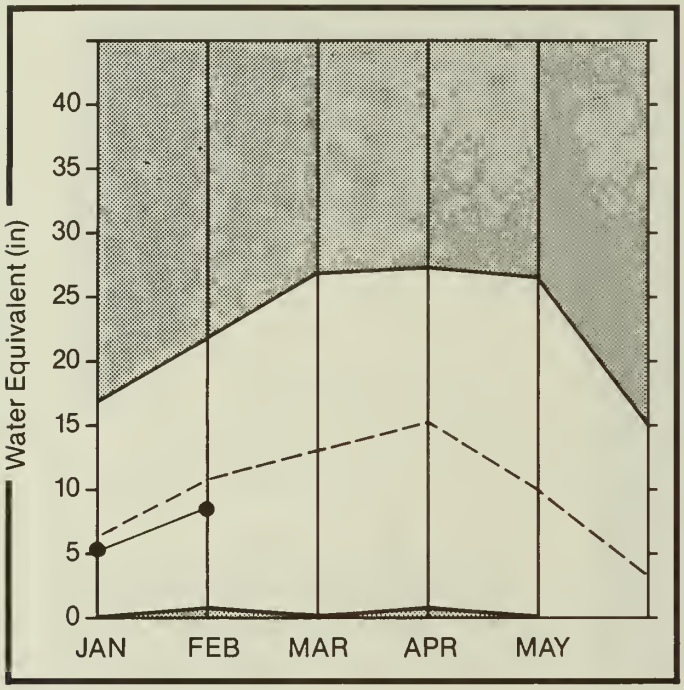
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	14	115	92
Ahtanum Creek	1	79	67

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

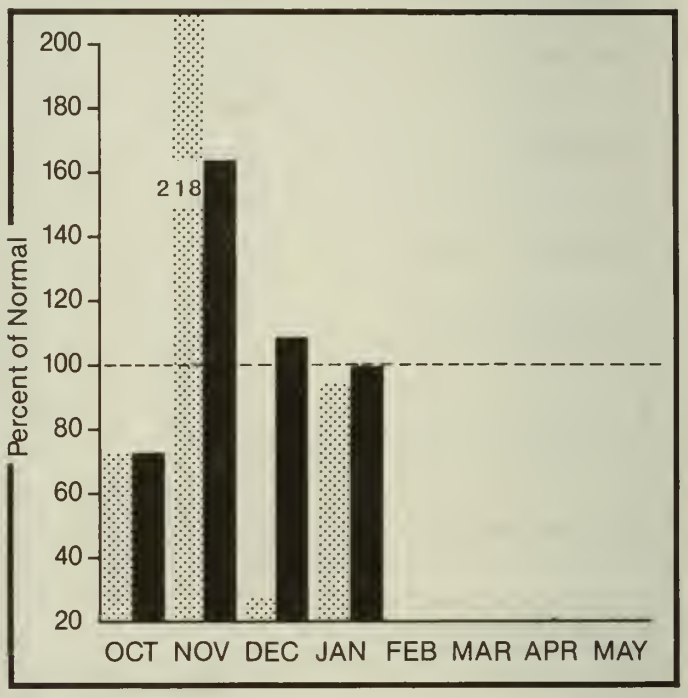
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

Forecasted streamflow in the Walla Walla Basin is 91% of average for the coming spring and summer. Snowpack in the Walla Walla River Basin is 76% of normal, based upon one snow course.
Precipitation for January was 95% of average and the water year to date precipitation has been 99% of normal. Streamflow for December in the Walla Walla River was 39% of normal. Temperatures for January were average.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MILL CREEK at Walla Walla	APR-SEP	17.5	16.0	91	22.0	126	10.0	57
	APR-JUL	17.3	15.8	91	22.0	127	10.0	58
	APR-JUN	17.2	15.6	91	22.0	128	10.0	58
COLUMBIA R. at The Dalles 2	APR-SEP	101000.0	77900.0	77	100000.0	99	55700.0	55
	APR-JUL	86500.0	66800.0	77	85800.0	99	47800.0	55
	APR-JUN	70100.0	54000.0	77	69400.0	99	38600.0	55

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.

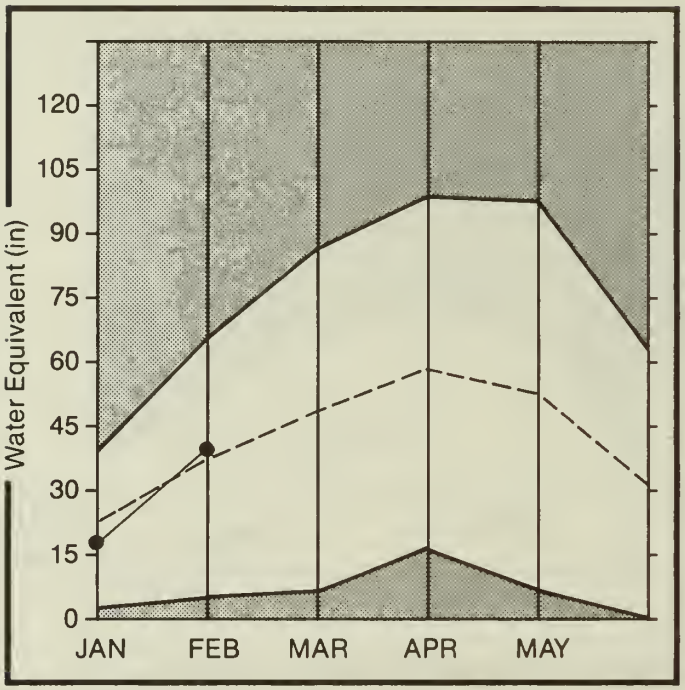
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Mill Creek	1	145	76

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

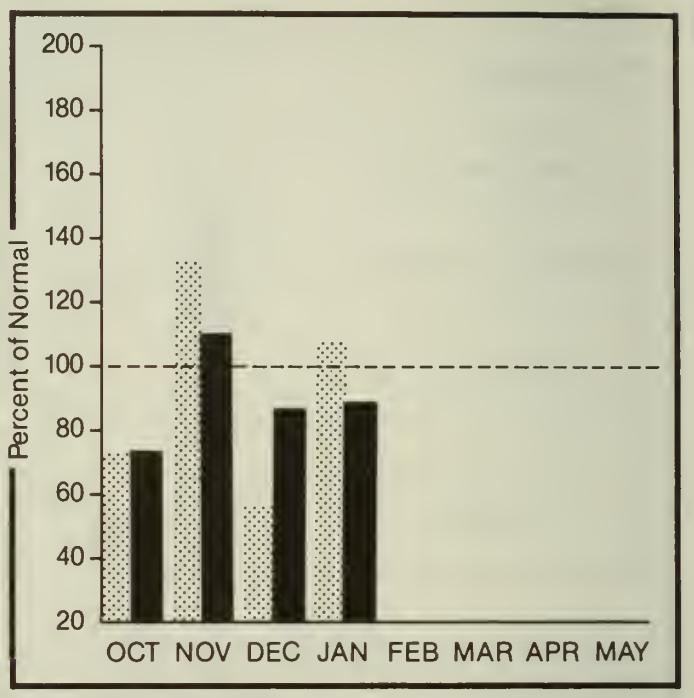
COWLITZ AND LEWIS

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflow is forecasted to be near normal for the coming water year. Forecasts for the Lewis River is 100% and for the Cowlitz River 97%. Snow cover for the Cowlitz-Lewis Basin is at 106% of normal, based upon measurements at 3 snow courses. Maximum water content was noted at the Plains of Abraham SNOTEL site where the snowpack contained 51.0 inches of water on February 1 (data may be affected by drifting). January precipitation was 105% of normal bringing the water year to date precipitation to 91% of average. January streamflow in the Cowlitz River was 59% of normal.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
LEWIS RIVER at Ariel 2	APR-SEP	1249.0	1250.0	100	1710.0	137	790.0	63
	APR-JUL	1086.0	1090.0	100	1490.0	137	690.0	64
	APR-JUN	961.0	960.0	100	1320.0	137	605.0	63
COWLITZ R. bl Mayfield Dam 2	APR-SEP	2038.0	2040.0	100	2880.0	141	1200.0	59
	APR-JUL	1778.0	1780.0	100	2510.0	141	1050.0	59
	APR-JUN	1502.0	1500.0	100	2120.0	141	885.0	59
COWLITZ R. at Castle Rock 2	APR-SEP	2673.0	2600.0	97	3480.0	130	1720.0	64
	APR-JUL	2323.0	2250.0	97	3020.0	130	1480.0	64
	APR-JUN	1980.0	1920.0	97	2570.0	130	1270.0	64

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.

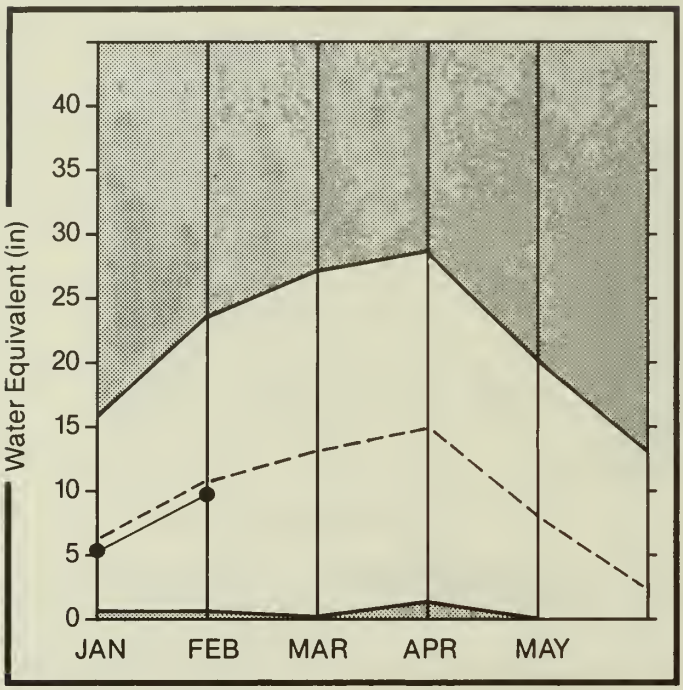
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Cowlitz River	1	105	87
Lewis River	4	127	109

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

WHITE - GREEN

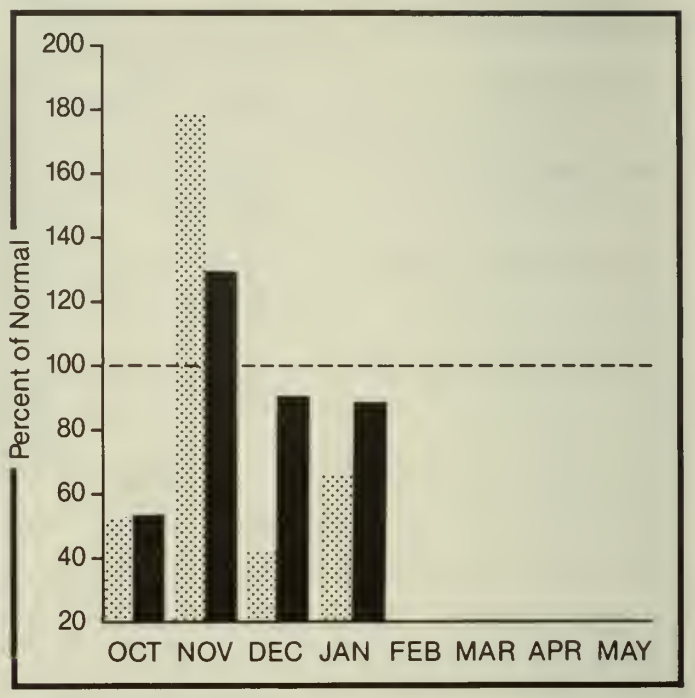
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

January runoff was near 60% of average. Summer runoff is forecasted to be 85% of normal on the Green River and Cedar River. Water content at the Cayuse Pass snow course was 48.4 inches of water content on February 5. Precipitation was 65% of normal for January bringing the water year to date to 88% of average. Snowpack is 85% of normal for the basin.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
GREEN RIVER bl Howard Hanson Dam 2	APR-SEP	316.0	270.0	85	365.0	116	175.0	55
	APR-JUL	284.0	245.0	86	330.0	116	160.0	56
	APR-JUN	256.0	220.0	86	295.0	115	145.0	57
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	80.0	86	108.0	116	52.0	56

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.

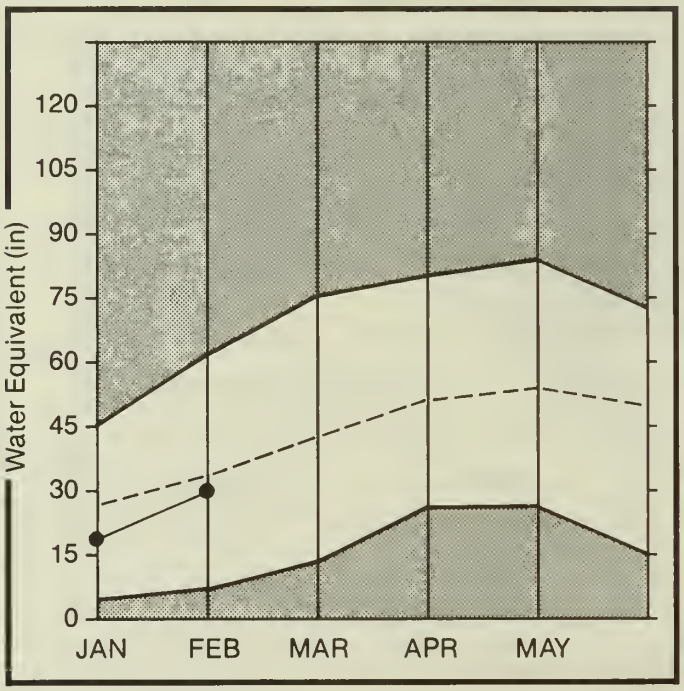
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
White River	2	159	129
Green River	6	138	85

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

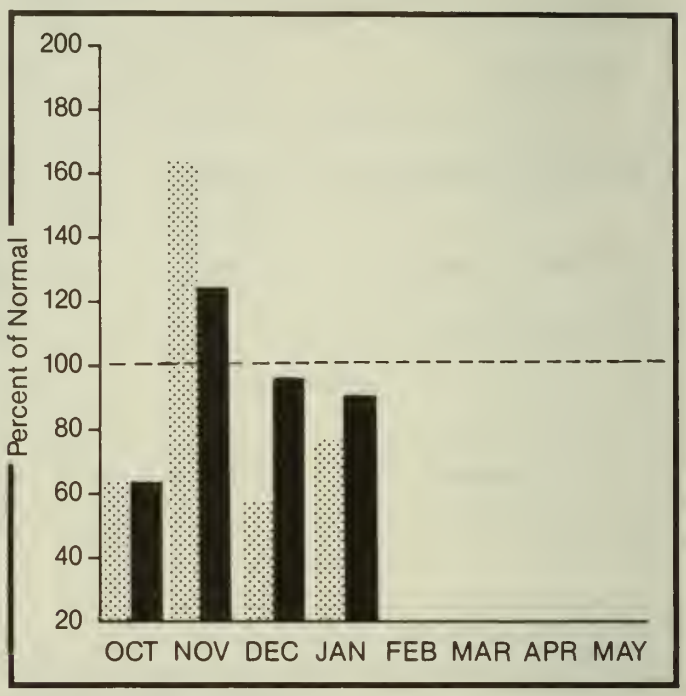
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

Precipitation values for December were 77% of average with a water year to date at 90%. Snowcover for the North Puget Basin is 86% of normal with the Lyman Lake SNOTEL site having 40.4 inches of water content as of February 1. Forecasted runoff for the Skagit River is 90% of normal. Reservoir storage is below average with Ross Lake storing 963,500 acre feet as of February 1; this is 93% of average and 68% of capacity. Temperatures were 1 degree above normal for January.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SKAGIT RIVER at Newhalem 2	APR-SEP	2356.0	2120.0	90	2640.0	112	1600.0	68
	APR-JUL	1972.0	1770.0	90	2200.0	112	1340.0	68
	APR-JUN	1485.0	1340.0	90	1670.0	112	1010.0	68

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
ROSS	1404.1	963.5	955.9	1033.9
DIABLO RESERVOIR	90.6	84.9	85.0	84.2
GORGE RESERVOIR	9.8	7.8	7.9	7.9

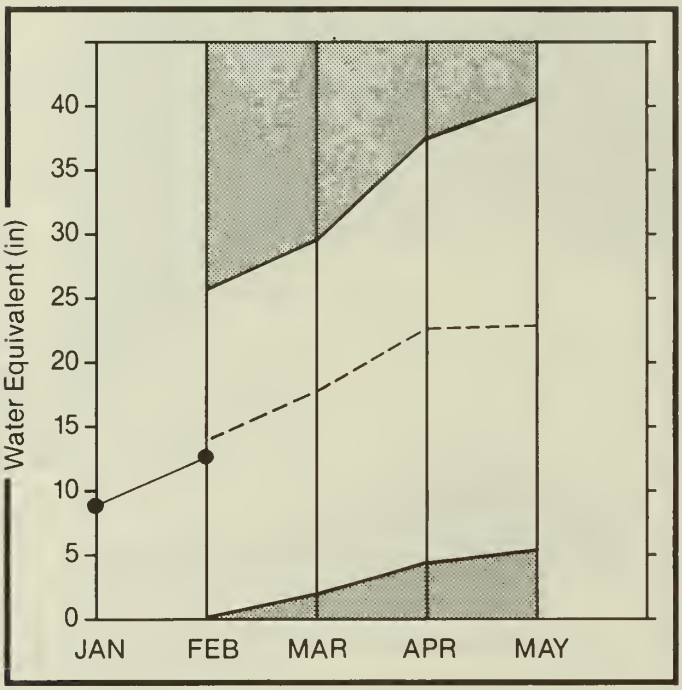
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
Skagit River	13	105	86
Baker River	9	131	99
Cedar River	0	0	0
Snoqualmie River	1	145	76
Skykomish River	2	148	122

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

OLYMPIC

Mountain snowpack* (inches)



*Based on selected stations

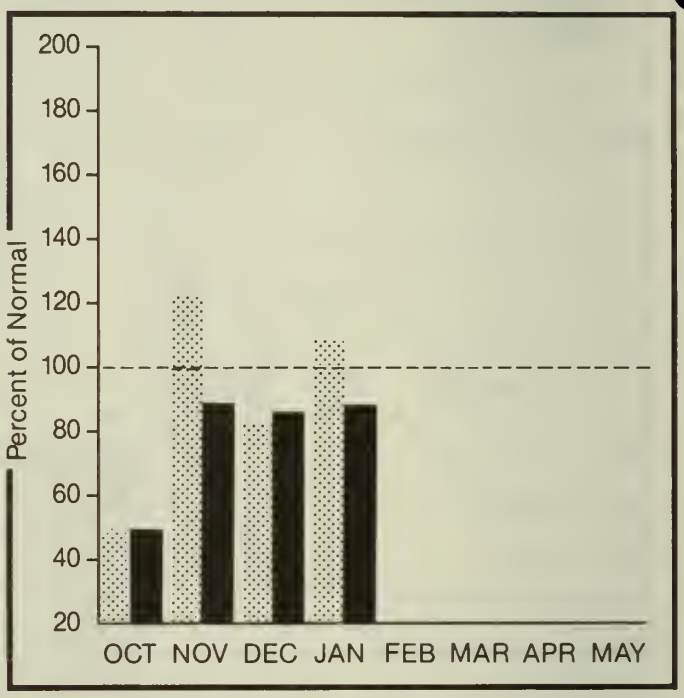
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Snow cover is 93% of normal based upon snow measurements at three sites in the Olympic Peninsula. January precipitation was 104% of average. The water year to date accumulation is 84% of average. Area streamflow was below normal during January. Forecasts of runoff for the Basins streams is 90% of average. Snow water measured at the Cox Valley snow course was 26.6 inches.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
DUNGENESS RIVER nr Sequim	APR-SEP	160.0	144.0	90	176.0	110	112.0	70
	APR-JUL	130.0	118.0	91	144.0	111	92.0	71
	APR-JUN	97.0	88.0	91	107.0	110	69.0	71
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	500.0	90				
	APR-JUL	454.0	410.0	90	501.0	110	319.0	70

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Dungeness River	1	121	91
Morse Creek	1	113	104
Elwha River	1	152	94

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

DATA CURRENT AS OF: 2/ 9/87 16:11:59

BASIN SUMMARY OF
SNOW COURSE DATA
FEBRUARY 1987

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
PEND OREILLE RIVER						
BENTON MEADOW	2370	1/30/87	10	2.4	5.0	5.1
BENTON SPRING	4920	1/30/87	33	8.6	10.8	13.2
BUNCHGRASS MOWFILLOW	5000	2/01/87	---	17.2	--	--
HEART LAKE TRAIL	4800	1/31/87	46	11.8	11.2	15.2
HOODOO BASIN	6050	1/31/87	84	26.6	26.2	34.6
HOODOO CREEK	5900	1/31/87	75	23.0	20.6	31.7
LOOKOUT	5140	1/30/87	54	16.6	17.2	23.6
NELSON CAN.	3100	1/27/87	37	9.0	8.4	11.3
SCHWEITZER BOWL	4800	1/29/87	53	15.3	12.7	21.4
SCHWEITZER RIDGE	6200	1/29/87	69	24.1	23.3	32.2
COLVILLE RIVER						
BAIRD	3220	1/26/87	20	4.2	--	5.8
TOGO	3370	1/30/87	26	6.0	8.4	8.2
KETTLE RIVER						
BARNES CREEK CAN.	5300	1/29/87	4	9.3	--	13.6
BIG WHITE MTN CAN.	5510	2/03/87	41	11.1	11.9	12.8
BUTTE CREEK	4070	1/27/87	21	4.9	6.4	6.7
CARMI CAN.	4100	2/01/87	21	4.2	3.8	5.0
FARRON CAN.	4000	1/26/87	25	5.7	9.0	9.8
GOAT CREEK	3600	1/27/87	19	4.2	5.4	5.4
MONASHEE PASS CAN.	4500	1/29/87	26	6.4	--	9.4
SUMMIT G.S.	4600	1/27/87	20	4.5	5.1	5.7
TRAPPING CK LOW CAN.	3050	1/31/87	17	3.1	--	4.2
TRAPPING CK UP CAN.	4460	2/01/87	26	5.2	5.7	7.1
OMAK LAKE, TWIN LAKES						
MOUNT TOLMAN	2000	1/28/87	17	3.8	--	--
TWIN LAKES	2700	1/27/87	23	5.1	--	--
WHITE RIVER						
CAYUSE PASS	5300	2/05/87	141	48.4	--	--
CORRAL PASS	6000	1/28/87	76	22.0	19.9	--
CORRAL PASS PILLOW	6000	2/01/87	---	39.4S	21.1	24.9
MORSE LAKE PILLOW	5400	2/01/87	---	37.5S	27.2	34.8
GREEN RIVER						
COUGAR MTN. PILLOW	3200	2/01/87	---	16.3S	10.7	18.6
GRASS MOUNTAIN #2	2900	2/03/87	24	6.3	.0	11.6
LESTER CREEK	3100	2/03/87	47	12.1	12.6	15.2
LYNN LAKE	4000	2/03/87	39	12.5	12.3	18.1
SAWMILL RIDGE	4700	2/03/87	78	26.3	--	24.3
STAMPEDE PASS PILLOW	3860	2/01/87	---	34.1S	23.1	37.0
TWIN CAMP	4100	2/03/87	56	17.9	13.1	16.8
CEDAR RIVER						
SNOQUALMIE RIVER						
OLALLIE MEADOWS	3630	1/29/87	68	22.9	15.8	30.2
SKYKOMISH RIVER						
STEVENS PASS PILLOW	4070	2/01/87	---	29.8S	26.2	29.7
STEVENS PASS SAND SO	3700	2/04/87	86	36.3	18.4	24.3
SKAGIT RIVER						
BEAVER CREEK TRAIL	2200	1/30/87	38	11.0	9.3	10.1
BEAVER PASS	3680	1/29/87	72	21.4	16.8	20.3
BROWN TOP AM	6000	1/29/87	124	39.6	41.4	41.7
DEVILS PARK	5900	1/29/87	86	27.0	29.6	31.0
FREEZEOUT CK. TRAIL	3500	1/29/87	38	9.5	7.0	9.3
GRANITE CREEK	3500	1/30/87	50	12.4	12.0	13.5
HARTS PASS PILLOW	6500	2/01/87	---	22.6S	26.9	39.1
KLESILKWA CAN.	3710	2/02/87	44	10.6	4.1	9.3
LYMAN LAKE PILLOW	5900	2/01/87	---	40.4S	34.6	45.0
MEADOWS CABIN	1900	1/30/87	10	3.1	3.1	5.7
NEW HOZOMEEN LAKE	2800	1/29/87	34	7.6	7.1	8.3
RAINY PASS PILLOW	4780	2/01/87	---	21.8S	25.0	34.3
THUNDER BASIN	2400	1/30/87	57	14.2	13.4	13.4
BAKER RIVER						
DOCK BUTTE AM	3800	2/06/87	118	47.2	31.8	41.6
EASY PASS AM	5200	2/06/87	136	54.4	38.7	46.5
JASPER PASS AM	5400	2/06/87	152	60.8	49.6	60.6
MARTEN LAKE AM	3600	2/06/87	114	45.6	40.0	49.2
MT. BLUM AM	5800	2/06/87	102	40.8	33.2	42.8
ROCKY CREEK AM	2100	/ 5/87	38	15.2	13.7	20.5
SCHREIBERS MOW AM	3400	2/06/87	96	38.4	25.2	35.6
SF THUNDER CK AM	2200	2/06/87	0	.0	.0	7.0
WATSON LAKES AM	4500	2/06/87	94	37.6	27.2	39.5
DUNGENESS RIVER						
DEER PARK	5200	1/31/87	48	12.7	10.5	13.9
MORSE CREEK						
COX VALLEY	4500	1/29/87	89	26.6	23.5	25.5
ELWHA RIVER						
HURRICANE	4500	1/30/87	50	13.4	8.8	14.2

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
SPOKANE RIVER						
ABOVE BURKE	4100	1/30/87	36	9.0	10.4	14.2
FOURTH OF JULY SUM	3200	1/30/87	21	6.0	8.3	7.1
LOOKOUT	5140	1/30/87	54	16.6	17.2	23.6
LOST LAKE	6110	1/27/87	82	25.8	27.9	39.1
MOSQUITO RIDGE	5200	1/30/87	55	18.8	17.2	26.2
SHERWIN	3200	2/01/87	---	6.5E	7.6	9.8
SUNSET	5540	1/29/87	45	13.2	12.4	22.8
NEWMAN LAKE						
RAGGED RIDGE	3330	1/28/87	23	3.8	3.8	--
OKANOGAN RIVER						
ABERDEEN LAKE CAN.	4300	1/30/87	16	3.3	3.6	5.0
BLACKWALL PEAK CAN.	6370	1/30/87	71	23.0	19.8	23.8
BRENDA MINE CAN.	4800	1/29/87	31	8.2	9.2	9.1
BROOKMERE CAN.	3200	2/01/87	33	7.3	5.1	6.5
ENDERBY CAN.	6200	1/28/87	79	28.6	26.5	24.8
ESPERON CK. MID CAN.	4690	2/01/87	38	8.9	8.6	10.8
GREYBACK RES CAN.	5120	2/02/87	23	4.0	5.7	6.1
HAMILTON HILL CAN.	4890	1/25/87	28	6.6	8.1	10.8
HARTS PASS PILLOW	6500	2/01/87	---	22.6S	26.9	39.1
ISINTOK LAKE CAN.	5500	1/31/87	16	2.6	4.8	5.6
LOST HORSE MTN CAN.	6300	1/27/87	20	4.3	5.9	6.5
MCCULLOCH CAN.	4200	1/30/87	18	3.1	4.1	5.0
MISSEZULA MTN CAN.	5090	1/26/87	21	4.4	6.7	6.9
MISSION CREEK CAN.	5800	1/30/87	33	9.2	14.4	13.3
MONASHEE PASS CAN.	4500	1/29/87	26	6.4	--	9.4
MT. KOBAU CAN.	5900	1/31/87	26	5.8	6.1	8.7
MUTTON CREEK #1	5700	1/29/87	32	6.2	6.4	9.7
OYAMA LAKE CAN.	4400	1/31/87	18	3.6	4.5	5.0
POSTILL LAKE CAN.	4500	1/30/87	20	3.5	4.5	5.8
RUSTY CREEK	4000	1/29/87	21	3.9	3.5	5.3
SALMON MOWS PILLOW	4500	2/01/87	---	6.2S	6.1	10.3
SILVER STAR MTN CAN.	6000	1/31/87	57	17.1	18.6	19.2
SUMMERLAND RES CAN.	4200	1/31/87	22	5.6	7.5	7.0
SUNDAY SUMMIT CAN.	4300	1/28/87	21	4.0	3.8	4.8
TROUT CREEK CAN.	4690	1/25/87	18	3.9	4.6	5.6
VASEUX CREEK CAN.	4600	1/28/87	13	2.3	3.1	4.4
WHITE ROCKS MTN CAN.	6000	1/30/87	43	13.7	12.6	15.7
METHOW RIVER						
HARTS PASS PILLOW	6500	2/01/87	---	22.6S	26.9	39.1
MUTTON CREEK #1	5700	1/29/87	32	6.2	6.4	9.7
RUSTY CREEK	4000	1/29/87	21	3.9	3.5	5.3
SALMON MOWS PILLOW	4500	2/01/87	---	6.2S	6.1	10.3
CHELAN LAKE BASIN						
CLOUDY PASS AM	6500	2/02/87	77	19.2	29.2	27.9
LYMAN LAKE PILLOW	5900	2/01/87	---	40.4S	34.6	45.0
LITTLE MOWS AM	5280	2/02/87	103	3.4	30.4	29.7
MIRROR LAKE PILLOW	5600	2/01/87	---	23.3S	23.5	22.6
PARK CK RIDGE PILLOW	4600	2/01/87	---	35.8S	33.7	32.3
RAINY PASS PILLOW	4780	2/01/87	---	21.8S	25.0	34.3
ENTIAT RIVER						
BRIEF	1600	1/28/87	24	5.0	7.0	6.1
POPE RIDGE	3540	2/08/87	57	15.3	13.9	13.6
WENATCHEE RIVER						
BERNE-MILL CREEK	3170	2/04/87	73	21.5	16.3	20.0
BLEWETT PASS#2PILLOW	4270	2/01/87	---	12.3S	13.6	18.1
CHIWAUKUM G.S.	2500	2/04/87	37	8.6	6.9	8.9
LYMAN LAKE PILLOW	5900	2/01/87	---	40.4S	34.6	45.0
MERRITT	2140	1/30/87	42	9.1	10.2	13.0
MISSION RIDGE	5000	2/02/87	42	10.3	12.6	--
STEVENS PASS PILLOW	4070	2/01/87	---	29.8S	26.2	29.7
STEVENS PASS SAND SO	3700	2/04/87	86	36.3	18.4	24.3
COLOCKUM CREEK						
TROUGH #2 PILLOW	5310	2/01/87	---	5.8S	8.7	8.7
SQUILCHUCK CREEK						
STEMILT CREEK						
STEMILT SLIDE	5000	1/31/87	38	8.3	11.3	10.5
UPPER WHEELER	4400	1/31/87	29	5.1	10.1	8.4
YAKIMA RIVER						
AHTANUM R.S.	3100	1/27/87	30	4.6	8.9	--
BLEWETT PASS#2PILLOW	4270	2/01/87	---	12.3S	13.6	18.1
BUMPING LAKE	3450	2/04/87	46	11.7	12.6	11.8
BUMPING LAKE (NEW)	3400	2/04/87	52	13.8	14.4	14.5
CAYUSE PASS	5300	2/05/87	141	48.4	--	--
COLOCKUM PASS	4120	1/28/87	33	8.1	15.0	11.8
CORRAL PASS PILLOW	6000	2/01/87	---	39.4S	21.1	24.9
FISH LAKE PILLOW	3370	2/01/87	---	21.9S	18.6	25.6
GREEN LAKE PILLOW	6000	2/01/87	---	9.6S	12.2	14.3
GROUSE CAMP PILLOW	5380	2/01/87	---	12.0S	15.1	13.6
LAKE CLE ELUM	2200	1/26/87	30	6.2	6.8	7.3
MORSE LAKE PILLOW	5400	2/01/87	---	37.5S	27.2	34.8
OLALLIE MEADOWS	3630	1/29/87	68	22.9	15.8	30.2
STAMPEDE PASS PILLOW	3860	2/01/87	---	34.1S	23.1	37.0
SASSE RIDGE PILLOW	4200	2/01/87	---	23.5S	15.8	24.8
TUNNEL AVENUE	2450	1/26/87	50	11.1	12.4	15.7
WHITE PASS ES PILLOW	4500	2/01/87	---	14.9S	14.2	17.2
AHTANUM CREEK						
AHTANUM R.S.	3100	1/27/87	30	4.6	8.9	--
GREEN LAKE PILLOW	6000	2/01/87	---	9.6S	12.2	14.3
MILL CREEK						
HIGH RIDGE PILLOW	4980	2/01/87	---	15.8S	10.9	20.8
TOUCHET #2 PILLOW	5530	2/01/87	---	20.4	15.5	--
LEWIS AND COWLITZ RIVERS						
CAYUSE PASS	5300	2/05/87	141	48.4	--	--
WHITE PASS ES PILLOW	4500	2/01/87	---	14.9S	14.2	17.2

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
  Corps of Engineers
U.S. Department of Agriculture
  Forest Service
U.S. Department of Commerce
  NOAA, National Weather Service
U.S. Department of the Interior
  Bonneville Power Administration
  Bureau of Reclamation
  Geological Survey
  National Park Service
  Bureau of Indian Affairs

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
Colville Confederated Tribes

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-200D LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

SOIL CONSERVATION SERVICE

☆ U.S. GOVERNMENT PRINTING OFFICE 1987—791-072-60000

551.573
Un36wwa

United States
Department of
Agriculture

**Soil
Conservation
Service**

Spokane,
Washington

Washington Water Supply Outlook

MARCH 1, 1987

The Library of the

MAR 23 1987

University of Illinois
at Urbana-Champaign

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Denver, CO 80211
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 97102
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97208
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

Washington Water Supply Outlook

and

Federal — State — Private Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Lynn A. Brown
State Conservationist
Soil Conservation Service
Spokane, Washington

Prepared by

William F. Weller
Water Supply Specialist
Room 360 U.S. Courthouse
Spokane, Washington 99201

All programs and services of the USDA are available to everyone without regard to race, creed, color, sex, age, handicap or national origin.

TABLE OF CONTENTS

STATE STREAMFLOW PROSPECTS MAP 1

STATE GENERAL OUTLOOK 2

BASIN OUTLOOK AND CONDITIONS

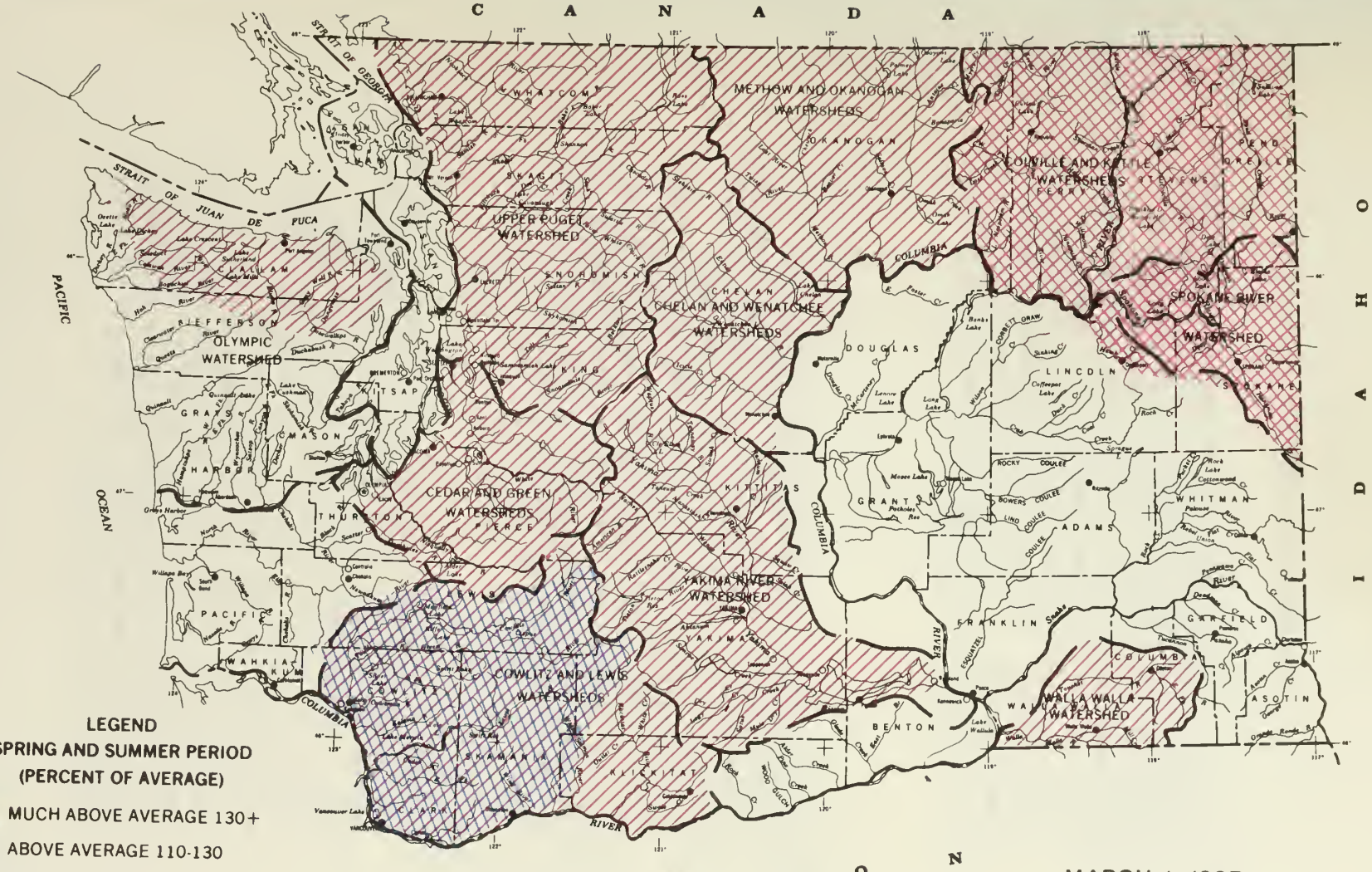
- SPOKANE 4
- COLVILLE AND PEND OREILLE 6
- OKANOGAN AND METHOW 8
- WENATCHEE AND CHELAN 10
- YAKIMA 12
- WALLA WALLA 14
- COWLITZ AND LEWIS 16
- WHITE - GREEN 18
- NORTH PUGET SOUND 20
- OLYMPIC 22

SNOW DATA 24

ADDITIONAL INFORMATION 25

U S DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



LEGEND
SPRING AND SUMMER PERIOD
(PERCENT OF AVERAGE)

- MUCH ABOVE AVERAGE 130+
- ABOVE AVERAGE 110-130
- NEAR AVERAGE 90-110
- BELOW AVERAGE 70-90
- MUCH BELOW AVERAGE 70+ LESS
- NOT FORECAST
- WATERSHED BOUNDARY

MARCH 1, 1987

STREAMFLOW PROSPECTS WASHINGTON

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Data compiled by SCS Field Personnel.

JANUARY 1986 4-R-39641

BASE 4-R-39260

GENERAL OUTLOOK

SUMMARY:

Reservoir storage remains below normal at the major irrigation projects throughout the state. Marchs Washingon water supply forecasts indicate below normal runoff for 1987 in Eastern Washington. Western Washington and the east side of the Cascade mountains will be near normal for the summer months. Snow cover and precipitation continue to be below average. February streamflows were below average except in south west Washington.
Note: This issue contains water conservation ideas for irrigators on page 26.

SNOWPACK:

Eastern Washington continues to be much below average with the Spokane Basin at 68% of normal down from 69% last month, and the Kettle River at 66% of average. The eastern slopes of the Cascade mountains remain much the same as last month with the Wenatchee Basin at 86%,and the Chelan Basin at 91%. The Yakima Basin at 81% of average is down from last months 90%. Along the west slopes of the Cascades the Lewis and Cowlitz Basin is at 82% and the Skagit and Olympic at 85% of normal.

PRECIPITATION:

Precipitation data from the National Weather Service (NWS) show February with much below average in the Spokane Basin at 61% and the Pend Oreille Basin 55%. February precipitation for the west side basins include the Cowlitz at 73% and the Olympic Peninsula at 69% of normal. The Walla Walla Basin with 101% of average water year to date precipitation is the only area above normal for the entire state. Other areas varies from 88% for the Cowlitz Basin to 53% for the Colville. February precipitation values from SNOTEL sites indicate a water year value near 82% of average for the high mountain areas of Washington.

RESERVOIRS:

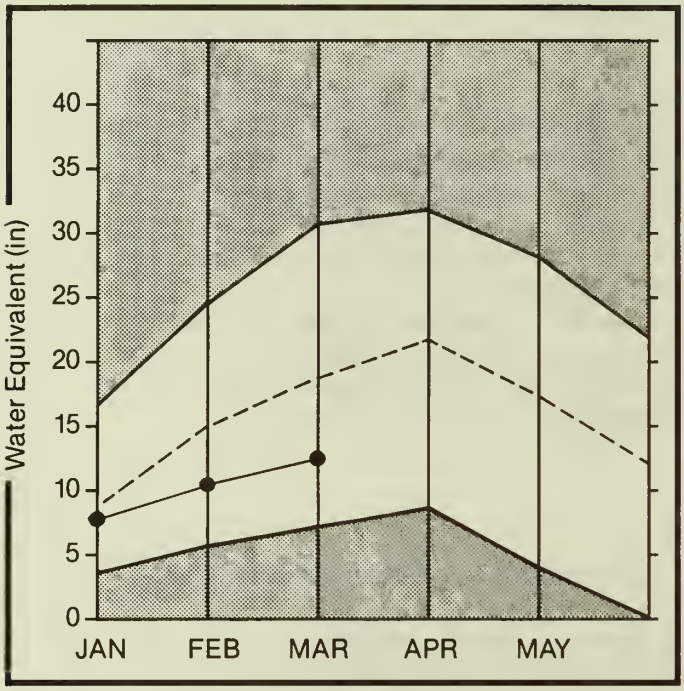
The Yakima Basin with storage as of March 1 of 391,400 acre feet is at 56% of average, down from 62% last month. Other major irrigation reservoir storage remains good in Washington for March 1, with Roosevelt at 165% of normal, Banks Lake at 109% and the Okanogan at 101% of average. The power reservoirs continue to suffer from low flows of last fall and winter with Coeur d' Alene at 42% of capacity, Chelan Lake at 35% of capacity and and Ross Lake at 50% of capacity .

STREAMFLOW:

February streamflows continued the summer and fall trend of below normal with only the Chehalis River at 117% being above average. Other February streamflows are: Spokane at Long Lake 54% (not corrected for upstream storage), Pend Oreille River 56%, Columbia River at Grand Coulee 60%, Chelan 59%, Skagit 78%, and the Walla Walla River 73%. Forecasts for streamflows for the western portion of Washington state remain almost the same as last month, which is below normal. Eastern Washington is in the worst condition with the Spokane and Pend Oreille being much below normal. Forecasts vary from 58% in the Spokane River to 96% in the Cowlitz River.

SPOKANE

Mountain snowpack* (inches)



*Based on selected stations

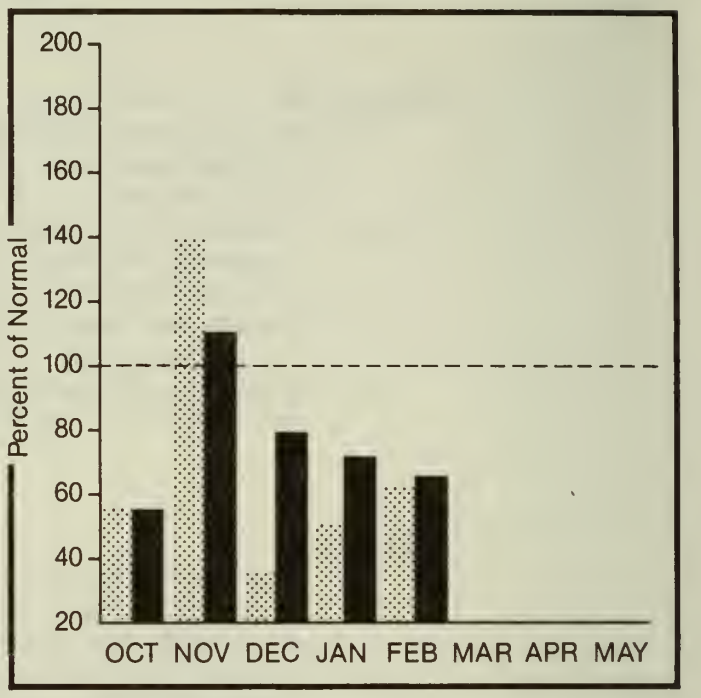
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

SPOKANE RIVER BASIN

WATER SUPPLY OUTLOOK:

Storage in Coeur d' Alene Lake was 123,200 acre feet compared to 125,400 last year; average storage in Cd'A for March 1 is 220,900 acre feet. February streamflow on the Spokane River continued below average at 54% at Long Lake, uncorrected for change of storage in Coeur d' Alene Lake. Forecasted spring and summer runoff is 58% of normal. This forecast is based upon a snowpack that is 68% of average and a water year to date precipitation value of 65% of normal, down from 71% for last month. Data for snow cover was obtained from 9 SNOTEL and manual snow courses. Maximun measured snowpack occurred at the Lost Lake snow course with 97 inches of snow and 33.1 inches of water content. Temperatures for Spokane for February were 3 degrees above normal.

For more information contact your local Soil Conservation Service office.

SPOKANE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SPOKANE at Post Falls	APR-SEP	2820.0	1650.0	59	2693.0	95	607.0	22
	APR-JUL	2723.0	1590.0	58	2598.0	95	582.0	21
SPOKANE at Long Lake	APR-JUL	3045.0	1770.0	58	2897.0	95	643.0	21

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
COEUR D'ALENE	291.2	123.2	125.4	220.9

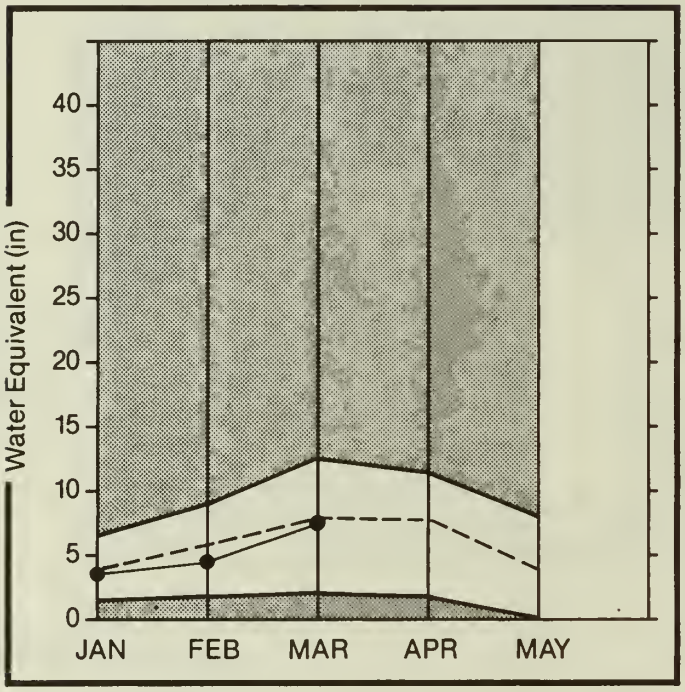
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Spokane River	19	89	69

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

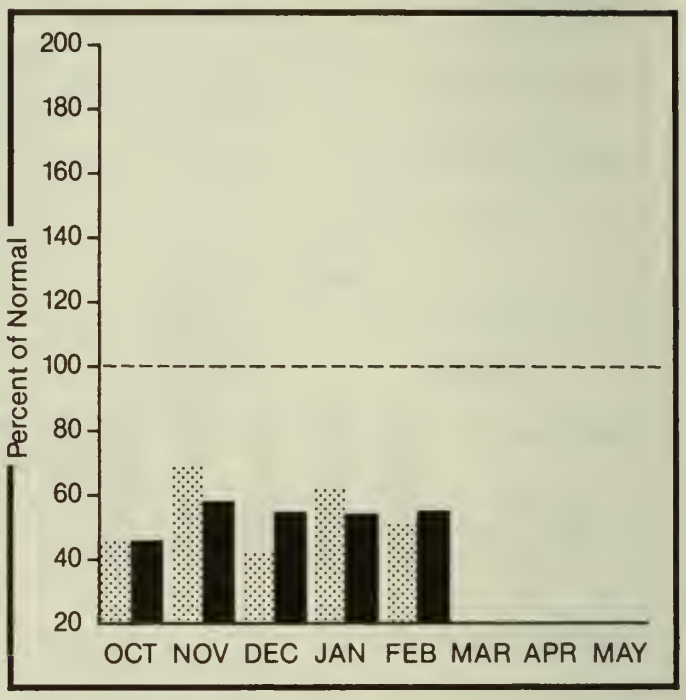
COLVILLE AND PEND OREILLE

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

COLVILLE - PEND OREILLE RIVER BASINS

WATER SUPPLY OUTLOOK:

Streamflows for the Pend Oreille River is forecasted to be 70%, Kettle River 69%, down from 80% last month, and the Colville River 69% of normal for the spring and summer runoff period. Streamflows for February were 56% of average on the Pend Oreille River, 72% on the Kettle River and 60% on the Columbia River below Grand Coulee. Pend Oreille River snowpack measurements are at 75% of normal based on nine snow course measurements. Basin-wide the snow cover is at 72% of average. Maximum snowpack measurement for the basin was at Schweitzer Ridge with 90 inches of snow and 36.7 inches of water. Precipitation during February was 55% of average bringing the water year to date to 53% of normal.

For more information contact your local Soil Conservation Service office.

COLVILLE - PEND OREILLE RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
PEND OREILLE RIVER bl Box Canyon 2	APR-SEP	15170.0	10600.0	70	13482.0	89	7718.0	51
	APR-JUL	13900.0	9710.0	70	12351.0	89	7069.0	51
	APR-JUN	11960.0	8370.0	70	10642.0	89	6098.0	51
CHAMOKANE CREEK	MAY-AUG	9.2	5.7	62	10.0	109	1.0	11
COLVILLE RIVER at Kettle Falls	APR-SEP	139.0	96.0	69	164.0	118	28.0	20
	APR-JUL	128.0	88.0	69	151.0	118	25.0	20
	APR-JUN	118.0	83.0	70	141.0	119	25.0	21
KETTLE RIVER nr Laurier	APR-SEP	1907.0	1320.0	69	1930.0	101	710.0	37
	APR-JUL	1807.0	1250.0	69	1828.0	101	672.0	37
	APR-JUN	1622.0	1120.0	69	1639.0	101	601.0	37
COLUMBIA RIVER at Birchbank 2	APR-SEP	44390.0	36900.0	83	43113.0	97	30687.0	69
	APR-JUL	35440.0	29500.0	83	34462.0	97	24538.0	69
	APR-JUN	25650.0	21290.0	83	24881.0	97	17699.0	69
COLUMBIA RIVER at Grand Coulee 2	APR-SEP	66460.0	51300.0	77	61268.0	92	41333.0	62
	APR-JUL	55730.0	43100.0	77	51460.0	92	34741.0	62
	APR-JUN	43420.0	33430.0	77	39943.0	92	26917.0	62

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
ROOSEVELT	5232.0	4550.9	4860.7	2763.0
BANKS	715.0	658.7	741.4	606.0

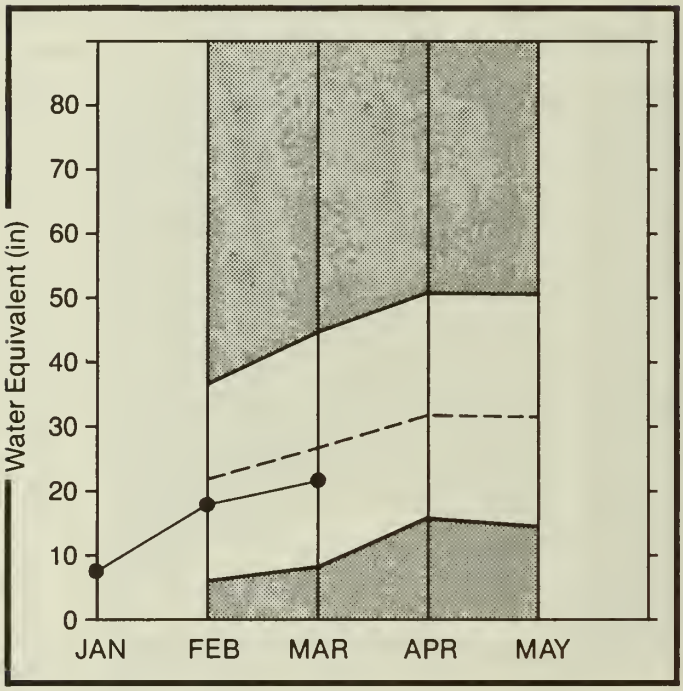
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Colville River	3	94	83
Pend Oreille River	12	92	74
Kettle River	9	84	71

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

OKANOGAN AND METHOW

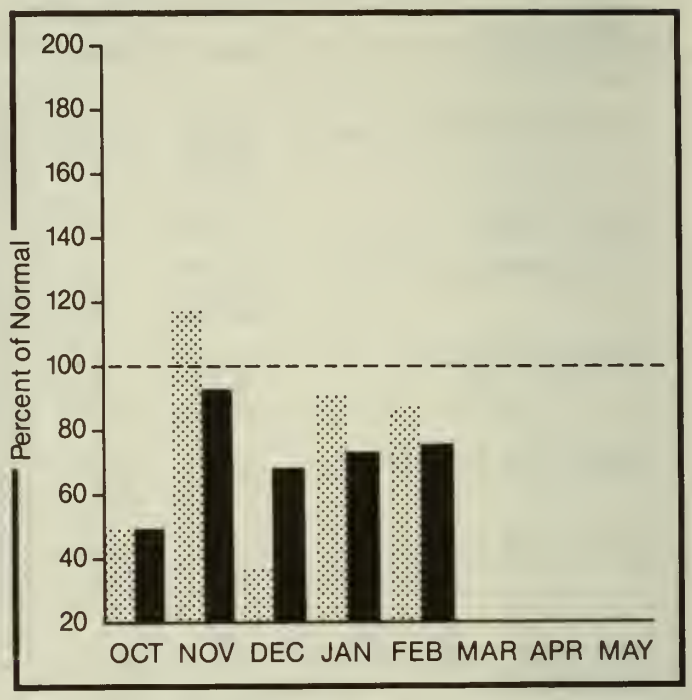
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

OKANOGAN - METHOW RIVER BASINS

WATER SUPPLY OUTLOOK:

Temperatures for February were 5 degrees above normal, bringing about an early melt of the low elevation snow. Spring and summer forecasts on the Okanogan River are for runoff of 76% of normal, 76% on the Methow River and 76% on the Similkameen River. Okanogan River streamflow was at 68% of average for February. Snow cover as of February 1 is 78% on the Okanogan, based upon data from 33 snow course measurements. Snow cover is 76% on the Methow. February precipitation in the Okanogan was at 86% with water year to date 75% of average. Storage in the Conconully Reservoirs is at 14,200 acre feet which is 60% of capacity and 101% of March 1 average.

For more information contact your local Soil Conservation Service office.

OKANOGAN - METHOW RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1432.0	1080.0	75	1467.0	102	693.0	48
	APR-JUL	1333.0	1010.0	76	1370.0	103	650.0	49
	APR-JUN	1128.0	875.0	78	1180.0	105	570.0	51
OKANOGAN R. nr Tonasket	APR-SEP	1661.0	1260.0	76	1875.0	113	645.0	39
	APR-JUL	1501.0	1140.0	76	1695.0	113	585.0	39
	APR-JUN	1255.0	975.0	78	1439.0	115	511.0	41
METHOW RIVER nr Pateros	APR-SEP	980.0	740.0	76	1063.0	108	417.0	43
	APR-JUL	907.0	685.0	76	984.0	108	386.0	43
	APR-JUN	769.0	595.0	77	849.0	110	341.0	44

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
CONCONULLY LAKE (SALMON)	10.5	8.0	8.0	8.0
CONCONULLY RESERVOIR	13.0	6.2	6.5	6.0

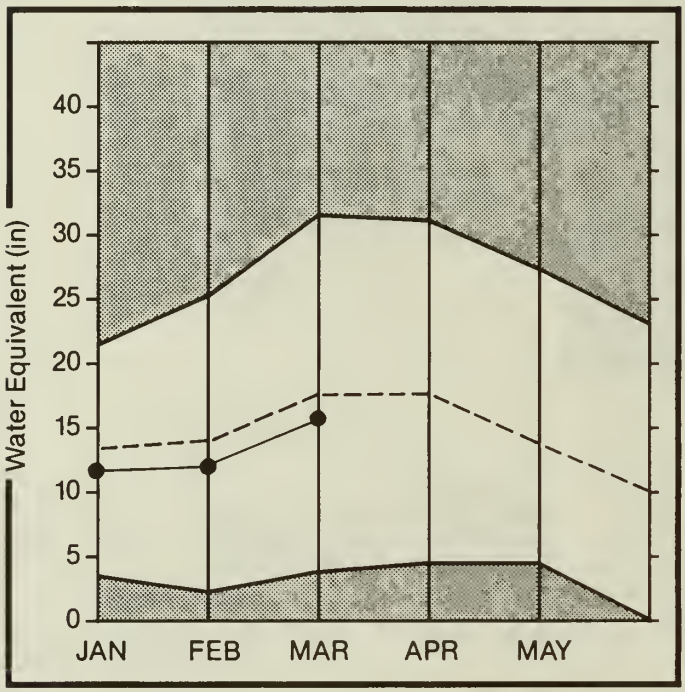
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Okanogan River	28	94	77
Methow River	4	107	76

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

WENATCHEE AND CHELAN

Mountain snowpack* (inches)



*Based on selected stations

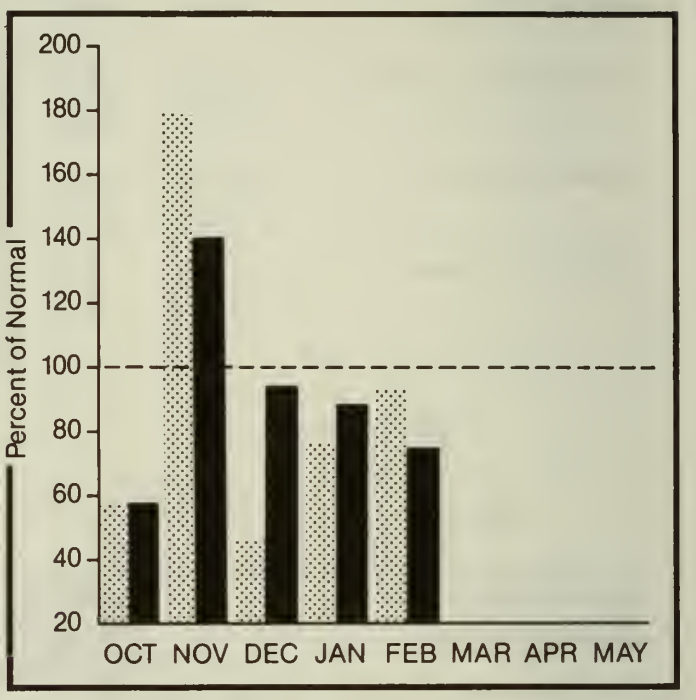
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WENATCHEE - CHELAN RIVER BASINS

WATER SUPPLY OUTLOOK:

Reservoir storage in Lake Chelan is at 165,900 acre feet or 99% of normal for March 1 and 25% of capacity. February streamflows were 59% of average for the Chelan River and 44% on the Wenatchee River. Snowpack in the Wenatchee Basin is at 86% of normal, while the Chelan is at 91% and the Entiat at 102%. Spring and summer runoff for the Wenatchee is forecast to be 85% of normal, down from the 87% from last month, and 84% in the Chelan Basin. Stehekin River runoff is forecast to be 83% of average. Stemilt and Icicle are forecast at 85%. February precipitation was 84% of normal in the basin and 87% for the water year to date.

For more information contact your local Soil Conservation Service office.

WENATCHEE - CHELAN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
CHELAN RIVER at Chelan 1	APR-SEP	1184.0	1000.0	84	1225.0	103	775.0	65
	APR-JUL	1040.0	875.0	84	1073.0	103	677.0	65
	APR-JUN	815.0	695.0	85	850.0	104	540.0	66
STEHEKIN R. at Stehekin	APR-SEP	844.0	700.0	83	810.0	96	590.0	70
	APR-JUL	714.0	590.0	83	683.0	96	497.0	70
	APR-JUN	541.0	460.0	85	530.0	98	390.0	72
ENTIAT RIVER nr Ardenvoir	APR-SEP	233.0	200.0	86	247.0	106	153.0	66
	APR-JUL	221.0	190.0	86	234.0	106	146.0	66
	APR-JUN	171.0	150.0	88	184.0	108	116.0	68
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1080.0	85	1486.0	117	674.0	53
	APR-JUL	1113.0	950.0	85	1306.0	117	594.0	53
	APR-JUN	899.0	765.0	85	1053.0	117	477.0	53
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	117.0	85	161.0	117	73.0	53
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	319.0	86	437.0	118	201.0	54
	APR-JUL	340.0	295.0	87	404.0	119	186.0	55
	APR-JUN	270.0	235.0	87	321.0	119	149.0	55
COLUMBIA R. bl Rock Island Dam 2	APR-SEP	72250.0	56400.0	78	67960.0	94	44840.0	62
	APR-JUL	61050.0	47800.0	78	57568.0	94	38032.0	62
	APR-JUN	47730.0	37230.0	78	44867.0	94	29593.0	62

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
CHELAN LAKE	676.1	165.9	238.4	168.1

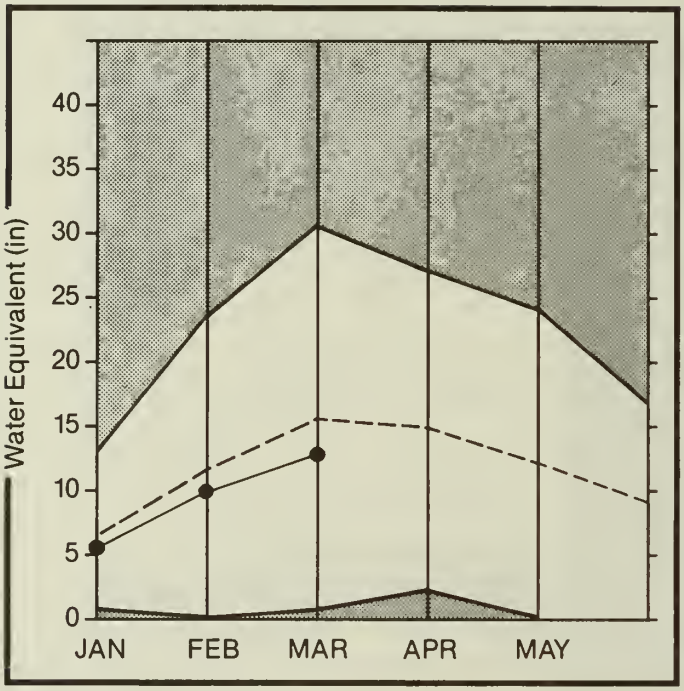
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Chelan Lake Basin	6	103	92
Entiat River	2	94	99
Wenatchee River	7	107	90
Colockum Creek	1	103	67
Squilchuck Creek	1	72	83
Stemilt Creek	2	73	79

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

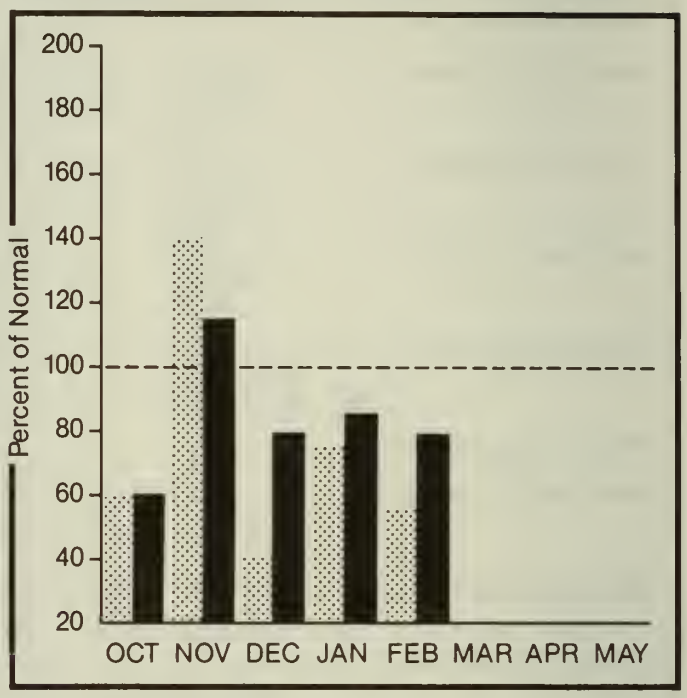
YAKIMA

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

YAKIMA RIVER BASIN

WATER SUPPLY OUTLOOK:

Reservoir storage is much below average with March 1 values for the five major reservoirs at 389,000 acre feet or 56% of normal. The Bureau of Reclamation reports that this is the lowest March 1 storage since 1933. Forecasts for the Yakima Basin call for runoff 83% of normal. These vary throughout the basin as follows: the Yakima River at Cle Elum 84%, Naches River 82%, the Yakima River at Parker 83% and Ahtanum Creek 81%. Snowpack is 83% of average in the Yakima Basin based upon measurements at 19 snow courses, last month's was 90% of normal. February precipitation was 53% of normal and 78% for the water year to date. January temperatures were one degree above average.

For more information contact your local Soil Conservation Service office.

YAKIMA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
YAKIMA RIVER at Martin 1	APR-SEP	136.0	113.0	83	128.0	94	98.0	72
	APR-JUL	126.0	105.0	83	119.0	94	91.0	72
	APR-JUN	112.0	93.0	83	105.0	94	81.0	72
YAKIMA RIVER at Cle Elum 2	APR-SEP	951.0	800.0	84	905.0	95	695.0	73
	APR-JUL	846.0	710.0	84	803.0	95	617.0	73
	APR-JUN	735.0	620.0	84	701.0	95	539.0	73
YAKIMA RIVER nr Parker 2	APR-SEP	2075.0	1720.0	83	2156.0	104	1284.0	62
	APR-JUL	1862.0	1540.0	83	1931.0	104	1149.0	62
	APR-JUN	1643.0	1380.0	84	1725.0	105	1035.0	63
KACHESS RIVER nr Easton 1	APR-SEP	133.0	113.0	85	132.0	99	94.0	71
	APR-JUL	114.0	97.0	85	113.0	99	81.0	71
	APR-JUN	102.0	87.0	85	101.0	99	73.0	72
CLE ELUM RIVER nr Roslyn 1	APR-SEP	459.0	390.0	85	445.0	97	335.0	73
	APR-JUL	417.0	355.0	85	405.0	97	305.0	73
	APR-JUN	353.0	300.0	85	342.0	97	258.0	73
BUMPING RIVER nr Nile 1	APR-SEP	139.0	115.0	83	146.0	105	84.0	60
	APR-JUL	128.0	106.0	83	134.0	105	78.0	61
	APR-JUN	106.0	88.0	83	111.0	105	65.0	61
AMERICAN RIVER nr Nile	APR-SEP	121.0	100.0	83	125.0	103	75.0	62
	APR-JUL	112.0	94.0	84	118.0	105	70.0	63
	APR-JUN	94.0	79.0	84	99.0	105	59.0	63
TIETON RIVER at Tieton 1	APR-SEP	244.0	200.0	82	256.0	105	144.0	59
	APR-JUL	208.0	170.0	82	218.0	105	122.0	59
	APR-JUN	168.0	138.0	82	177.0	105	99.0	59
NACHES RIVER nr Naches 2	APR-SEP	860.0	700.0	81	898.0	104	502.0	58
	APR-JUL	779.0	630.0	81	809.0	104	451.0	58
	APR-JUN	667.0	540.0	81	693.0	104	387.0	58
AHTANUM CREEK nr Tampico 2	APR-SEP	47.0	38.0	81	56.0	119	20.0	43
	APR-JUL	43.0	35.0	81	51.0	119	19.0	44
	APR-JUN	37.0	30.0	81	44.0	119	16.0	43

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
KEECHELUS	157.8	69.0	81.9	105.0
KACHESS	239.0	71.8	128.6	179.0
CLE ELEM	436.9	114.2	173.7	273.0
BUMPING LAKE	33.7	13.9	17.2	10.0
RIMROCK	198.0	120.1	153.8	130.0

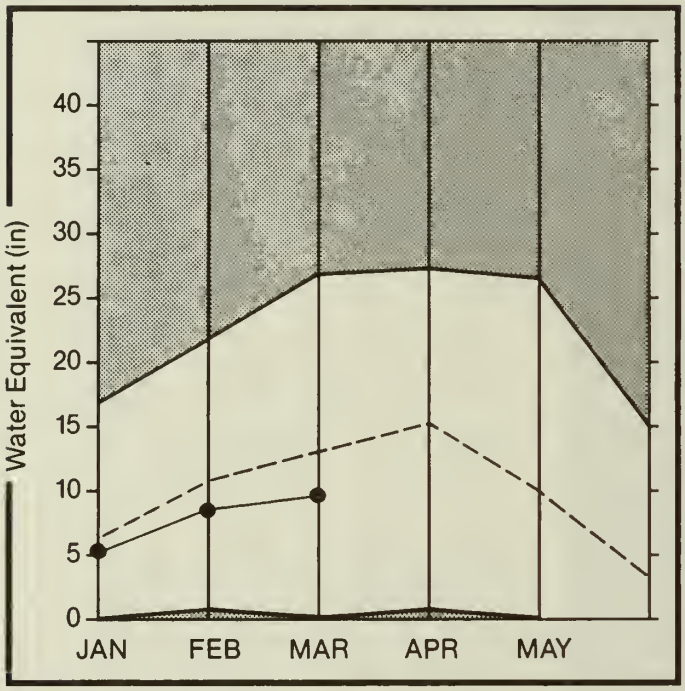
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Yakima River	16	100	83
Ahtanum Creek	2	94	97

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

WALLA WALLA

Mountain snowpack* (inches)



*Based on selected stations

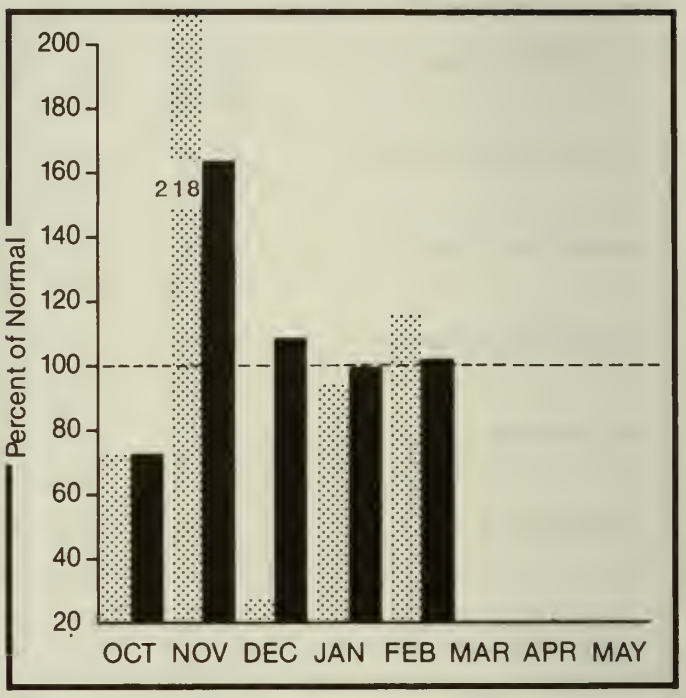
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WALLA WALLA RIVER BASIN

WATER SUPPLY OUTLOOK:

February precipitation was 116% of average and the water year to date precipitation has been 101% of normal. Streamflow in the Walla Walla Basin is Forecast 89% of average for the coming spring and summer. Snowpack in the Walla Walla River Basin is 73% of normal, based upon two snow courses. Streamflow for February in the Walla Walla River was 73% of normal. February temperatures were average.

For more information contact your local Soil Conservation Service office.

WALLA WALLA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MILL CREEK at Walla Walla	APR-SEP	17.5	15.6	89	21.0	120	11.0	63
	APR-JUL	17.3	15.4	89	20.0	115	10.0	58
	APR-JUN	17.2	15.3	89	20.0	117	10.0	58
SF WALLA WALLA nr MiltonFreewater	APR-JUL	55.0	48.0	87	59.0	107	37.0	67
COUSE CK nr Milton Freewater	APR-JUL	3.6	3.1	86	4.0	111	2.0	56
PINE CREEK nr Weston	APR-JUL	2.7	2.3	85	3.0	111	1.0	37
COLUMBIA R. at The Dalles 2	APR-SEP	101800.0	74100.0	73	92424.0	91	63500.0	62
	APR-JUL	87100.0	63500.0	73	79180.0	91	47820.0	55
	APR-JUN	70470.0	51440.0	73	64125.0	91	38755.0	55

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.

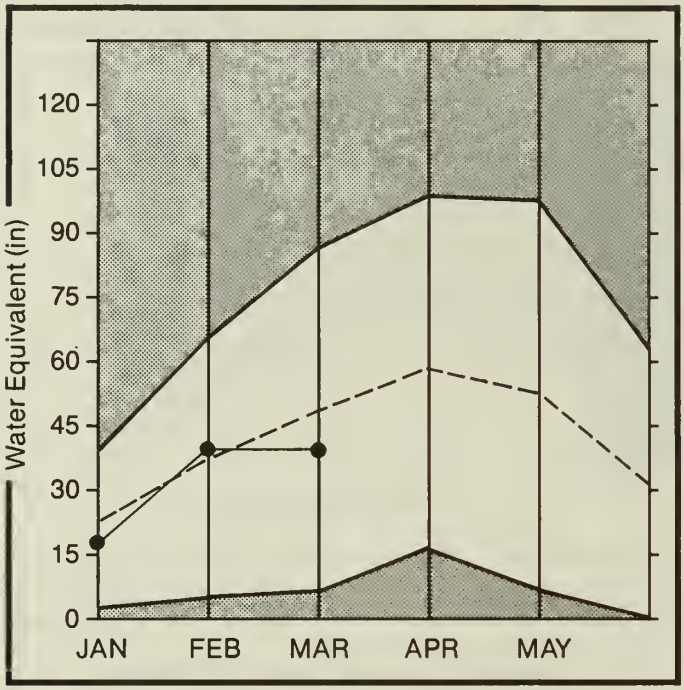
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Mill Creek	1	116	73

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

COWLITZ AND LEWIS

Mountain snowpack* (inches)



*Based on selected stations

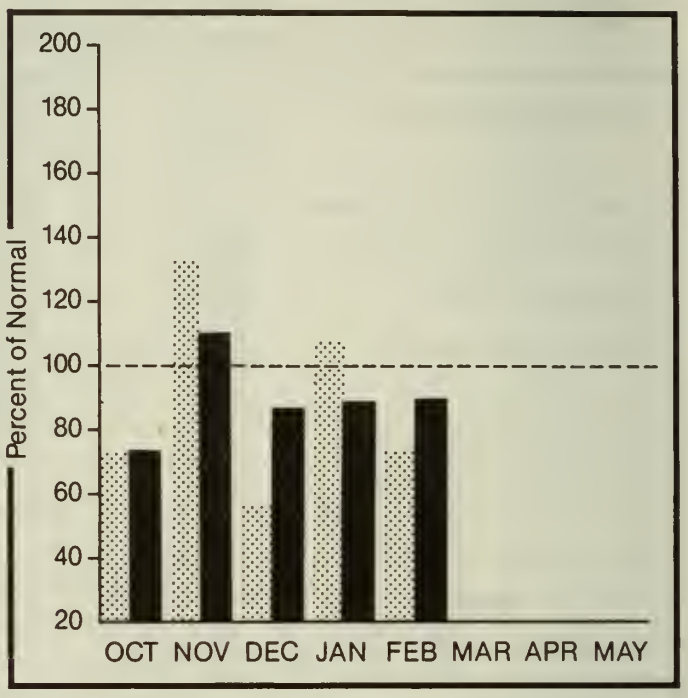
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

COWLITZ - LEWIS RIVER BASINS

WATER SUPPLY OUTLOOK:

March 1 snow cover for the Cowlitz-Lewis Basin is at 82% of normal, based upon measurements at 14 snow courses. Maximum water content was noted at the Plains of Abraham SNOTEL site where the snowpack contained 61.5 inches of water on March 1 (data may be affected by drifting). February precipitation was 73% of normal bringing the water year to date precipitation to 88% of average. Streamflow is forecasted to be near normal for the coming water year. Forecasts for the Lewis River is 95% and for the Cowlitz River 96%. February streamflow in the Cowlitz River was 100% of normal.

For more information contact your local Soil Conservation Service office.

COWLITZ - LEWIS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
LEWIS RIVER at Ariel 2	APR-SEP	1244.0	1180.0	95	1553.0	125	807.0	65
	APR-JUL	1084.0	1030.0	95	1355.0	125	705.0	65
	APR-JUN	958.0	910.0	95	1197.0	125	623.0	65
COWLITZ R. bl Mayfield Dam 2	APR-SEP	2036.0	1950.0	96	2663.0	131	1237.0	61
	APR-JUL	1782.0	1710.0	96	2334.0	131	1086.0	61
	APR-JUN	1524.0	1460.0	96	1993.0	131	927.0	61
COWLITZ R. at Castle Rock 2	APR-SEP	2687.0	2580.0	96	3520.0	131	1640.0	61
	APR-JUL	2343.0	2250.0	96	3070.0	131	1430.0	61
	APR-JUN	2015.0	1930.0	96	2635.0	131	1225.0	61

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.

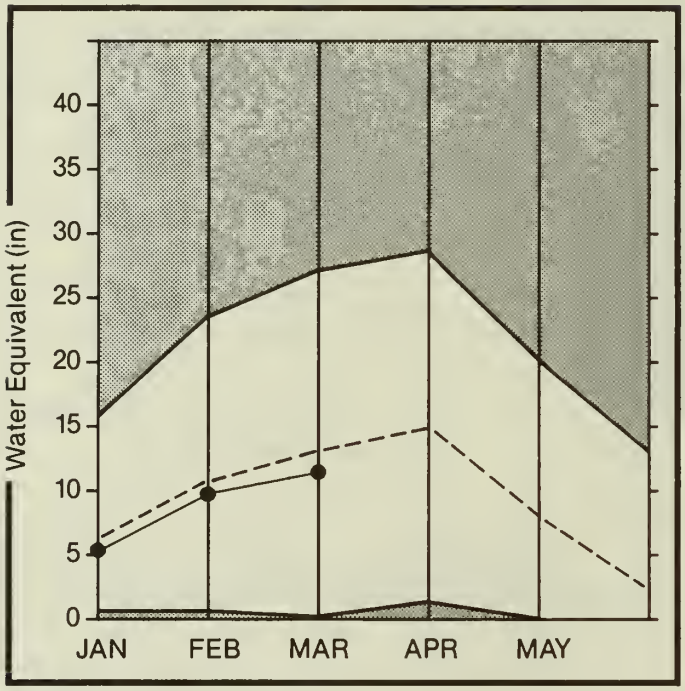
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Cowlitz River	2	106	82
Lewis River	4	122	106

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

WHITE - GREEN

Mountain snowpack* (inches)



*Based on selected stations

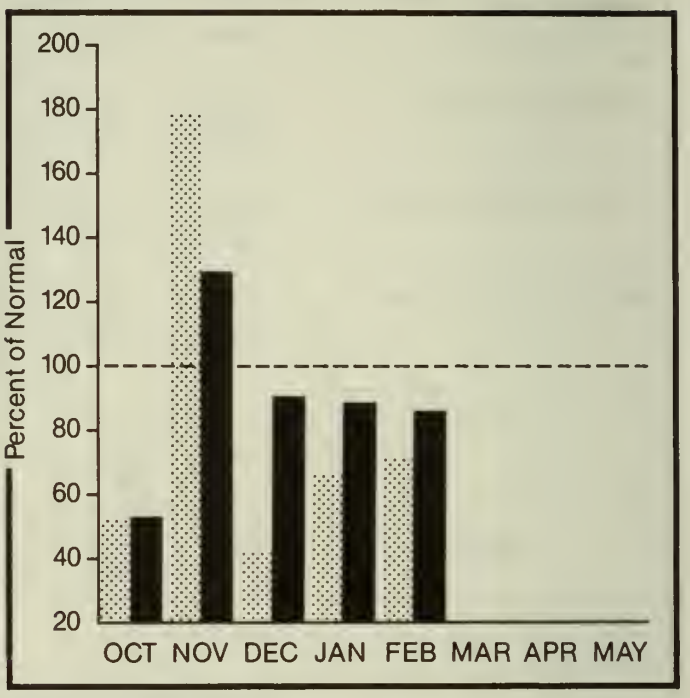
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WHITE - GREEN RIVER BASINS

WATER SUPPLY OUTLOOK:

February precipitation was 70% of normal bringing the water year to date to 85% of average. Snowpack is 77% of normal for the basin. February runoff was near 60% of average. Summer runoff is forecasted to be 89% of normal on the Green River and 90% on the Cedar River. Water content at the Cayuse Pass snow course was 56.7 inches of water content on March 1. Temperatures for February averaged three degrees above normal resulting in a melt of the low elevation snow.

For more information contact your local Soil Conservation Service office.

WHITE - GREEN RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
GREEN RIVER bl Howard Hanson Dam 2	APR-SEP	291.0	260.0	89	333.0	114	187.0	64
	APR-JUL	261.0	230.0	88	295.0	113	165.0	63
	APR-JUN	236.0	210.0	89	269.0	114	151.0	64
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	84.0	90	107.0	115	61.0	66

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.

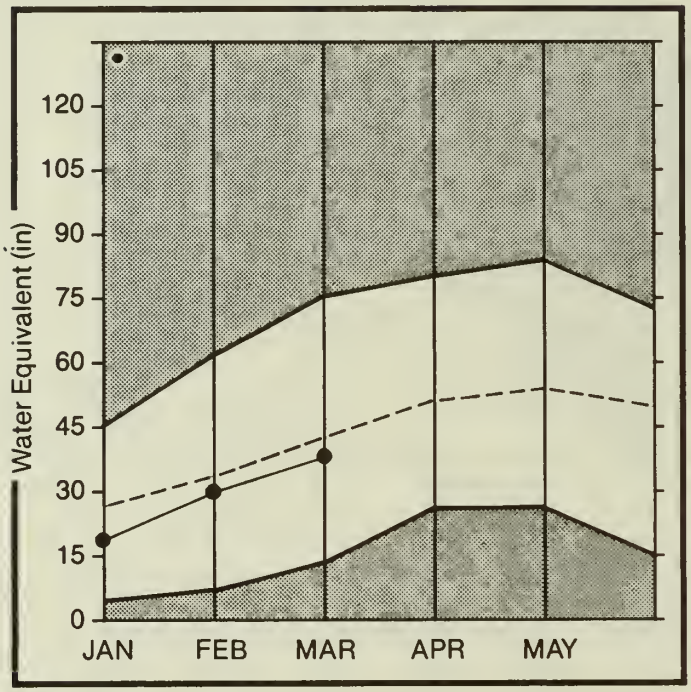
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
White River	3	112	92
Green River	6	173	89

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

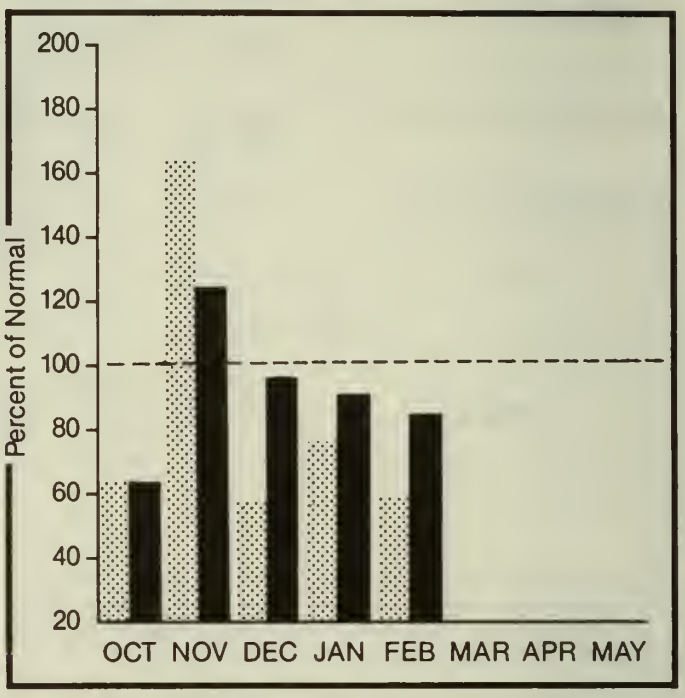
NORTH PUGET SOUND

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

NORTH PUGET SOUND RIVER BASINS

WATER SUPPLY OUTLOOK:

March 1 snowcover for the North Puget Basin is 86% of normal with the Lyman Lake SNOTEL site having 46.8 inches of water content. Precipitation values for February were 58% of average with a water year to date at 85% of normal. Forecasted runoff for the Skagit River is 87% of normal. Reservoir storage is above average with Ross Lake storing 706,900 acre feet as of February 1; 50% of capacity. Temperatures were 3 degree above normal for February.

For more information contact your local Soil Conservation Service office.

NORTH PUGET SOUND RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SKAGIT RIVER at Newhalem 2	APR-SEP	2264.0	1990.0	88	2465.0	109	1515.0	67
	APR-JUL	1891.0	1670.0	88	2067.0	109	1273.0	67
	APR-JUN	1442.0	1280.0	89	1583.0	110	977.0	68

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVG.
ROSS	1404.1	706.9	869.2	307.6
DIABLO RESERVOIR	90.6	82.9	85.6	---
GORGE RESERVOIR	9.8	8.1	7.6	---

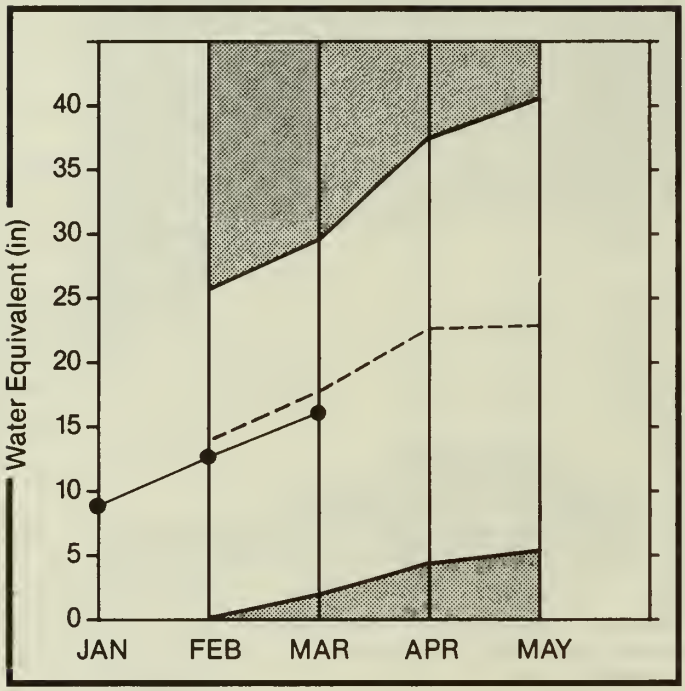
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Skagit River	14	98	84
Baker River	8	115	78
Cedar River	2	83	39
Snoqualmie River	1	128	68
Skykomish River	2	116	98

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

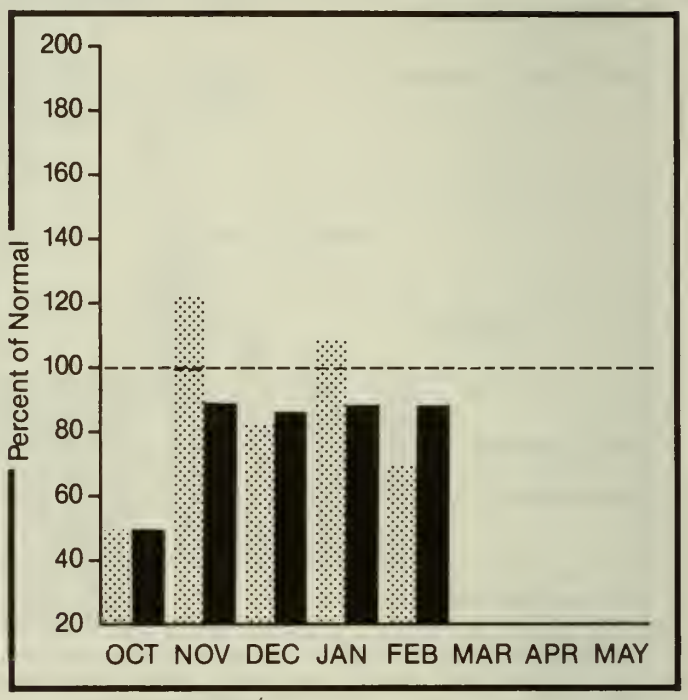
OLYMPIC

Mountain snowpack* (inches)



*Based on selected stations

Precipitation* (percent of normal)



*Based on selected stations

Maximum
Minimum
Average
Current
Monthly precipitation
Year to date precipitation

OLYMPIC PENINSULA RIVER BASINS

WATER SUPPLY OUTLOOK:

Area streamflow was below normal during February. Forecasts of runoff for streams in the basin are 88% of average. Snow cover is 85% of normal based upon snow measurements at three sites in the Olympic Peninsula. February precipitation was 69% of average. The water year to date accumulation is 87% of normal. Snow water measured at the Cox Valley snow course was 32.0 inches with a depth of 84 inches. Temperatures in the basin were three degrees above average for February.

For more information contact your local Soil Conservation Service office.

OLYMPIC PENINSULA RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
DUNGENESS RIVER nr Sequim	APR-SEP	159.0	140.0	88	169.0	106	111.0	70
	APR-JUL	129.0	113.0	88	136.0	105	90.0	70
	APR-JUN	97.0	87.0	90	104.0	107	70.0	72
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	495.0	90	595.0	108	395.0	71
	APR-JUL	454.0	405.0	89	487.0	107	323.0	71

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVG.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR.	AVERAGE
Dungeness River	1	133	83
Morse Creek	1	119	97
Elwha River	1	164	87

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.
2 - Corrected for upstream diversions or changes in reservoir storage.
The average is computed for the 1961-85 base period.

DATA CURRENT AS OF: 3/ 9/87 15:20:39

BASIN SUMMARY OF SNOW COURSE DATA

MARCH 1987

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
PENO OREILLE RIVER						
BENTON MEADOW	2370	2/25/87	10	2.8	6.8	6.0
BENTON SPRING	4920	2/25/87	39	13.3	12.1	17.2
BOYER MOUNTAIN	5250	2/26/87	51	16.4	19.1	22.3
BUMCNGRASS MOWPILLOW	5000	3/01/87	---	19.4	18.8	24.2
CHEWALAN	4930	2/26/87	38	12.2	9.9	13.9
HEART LAKE TRAIL	4800	2/28/87	46	13.7	18.7	19.5
HOOOOO BASIN	6050	2/28/87	90	31.8	40.1	43.9
HOOOOO CREEK	5900	2/28/87	79	27.4	33.1	40.7
LOOKOUT	5140	2/24/87	63	20.5	25.6	29.5
NELSON CAN.	3100	2/24/87	37	11.5	11.4	14.3
SCHWEITZER BOWL	4800	2/27/87	56	18.5	15.2	27.2
SCHWEITZER RIDGE	6200	2/27/87	90	34.7	29.7	40.1
COLVILLE RIVER						
BAIRD	3220	2/25/87	20	6.5	6.7	6.9
CHEWALAH	4930	2/26/87	38	12.2	9.9	13.9
TOGO	3370	2/26/87	26	6.5	10.3	9.6
KETTLE RIVER						
BARNES CREEK CAN.	5300	2/23/87	41	10.2	13.6	17.2
BIG WHITE MTN CAN.	5510	2/28/87	39	12.2	14.6	16.3
BUTTE CREEK	4070	2/26/87	21	5.8	7.3	8.6
CARMI CAN.	4100	2/28/87	18	4.3	5.6	6.1
FARRON CAN.	4000	2/25/87	31	8.8	11.4	12.4
GOAT CREEK	3600	2/26/87	17	5.2	6.4	6.6
NONASNEE PASS CAN.	4500	2/23/87	28	6.2	8.3	12.2
SUMMIT G.S.	4600	2/26/87	24	6.5	5.1	7.3
TRAPPING CK LOW CAN.	3050	2/25/87	14	3.9	5.0	5.1
TRAPPING CK UP CAN.	4460	2/28/87	23	6.3	6.9	9.1
OMAK LAKE, TWIN LAKES						
MOUNT TOLMAN	2000	2/23/87	8	2.4	4.4	--
TWIN LAKES	2700	2/25/87	21	6.1	7.4	--
SPOKANE RIVER						
ABOVE BURKE	4100	2/24/87	42	10.4	14.9	19.0
FOURTH OF JULY SUM	3200	2/24/87	30	6.2	8.8	8.2
LOOKOUT	5140	2/24/87	63	20.5	25.6	29.5
LOST LAKE	6110	2/25/87	97	33.1	40.9	48.9
MOSQUITO RIDGE	5200	2/26/87	72	22.9	25.3	33.7
SNOWIM	3200	2/26/87	26	8.5	10.8	12.3
SUMSET	5540	2/26/87	62	19.4	23.7	28.1
NEWMAN LAKE						
RAGGED RIDGE	3330	2/28/87	21	5.6	4.3	--
OKANOGAN RIVER						
ABERDEEN LAKE CAN.	4300	2/27/87	17	3.5	4.5	5.9
BLACKWALL PEAK CAN.	6370	2/24/87	73	26.1	25.9	29.6
BREMDA MINE CAN.	4800	2/26/87	35	11.4	10.8	11.9
BROOKMERE CAN.	3200	2/28/87	33	9.2	7.2	8.0
EMDERBY CAN.	6200	2/26/87	82	31.4	31.9	32.6
ESPERON CK. LO CAN.	4400	2/28/87	28	7.5	8.0	10.6
ESPERON CK. MID CAN.	4690	2/28/87	34	9.1	10.2	13.2
ESPERON CK. UP CAN.	5410	2/28/87	36	10.2	10.1	15.7
GREYBACK RES CAN.	5120	2/23/87	26	5.1	7.0	7.8
HAMILTON HILL CAN.	4890	2/24/87	37	8.8	10.6	13.7
HARTS PASS PILLOW	6500	3/01/87	---	35.7S	37.5	47.1
ISINTOK LAKE CAN.	5500	2/28/87	21	4.2	5.7	6.8
LOST HORSE MTN CAN.	6300	3/02/87	25	5.6	7.7	8.1
MCCULLOCH CAN.	4200	2/26/87	18	4.2	4.6	6.4
MISSEZULA MTN CAN.	5090	2/25/87	33	8.9	9.4	9.0
MISSION CREEK CAN.	5800	2/27/87	37	10.6	15.0	17.2
NONASMEE PASS CAN.	4500	2/23/87	28	6.2	8.3	12.2
MT. KOBAU CAN.	5900	2/28/87	30	7.8	8.6	10.7
MUTTON CREEK #1	5700	2/26/87	36	9.6	6.2	11.9
OYAMA LAKE CAN.	4400	2/27/87	19	4.4	4.7	6.1
POSTILL LAKE CAN.	4500	2/28/87	22	3.8	5.2	7.4
RUSTY CREEK	4000	2/26/87	22	6.0	4.4	6.5
SALMON MOWS PILLOW	4500	3/01/87	---	7.8S	7.2	12.6
SILVER STAR MTN CAN.	6000	2/28/87	59	20.8	23.2	24.3
SUMMERLAND RES CAN.	4200	2/28/87	25	7.0	8.5	8.7
SUNDAY SUMMIT CAN.	4300	2/26/87	24	5.6	3.9	5.5
TROUT CREEK CAN.	4690	2/25/87	22	5.4	6.8	6.7
VASEUX CREEK CAN.	4600	2/23/87	18	3.1	4.6	5.9
WHITE ROCKS MTN CAN.	6000	2/27/87	50	16.6	15.0	20.0
METHOW RIVER						
HARTS PASS PILLOW	6500	3/01/87	---	35.7S	37.5	47.1
MUTTON CREEK #1	5700	2/26/87	36	9.6	6.2	11.9
RUSTY CREEK	4000	2/26/87	22	6.0	4.4	6.5
SALMON MOWS PILLOW	4500	3/01/87	---	7.8S	7.2	12.6
CHELAN LAKE BASIN						
CLOUDY PASS AM	6500	2/24/87	89	31.2	34.0	33.5
LYMAN LAKE PILLOW	5900	3/01/87	---	48.2S	44.3	55.9
LITTLE MOWS AM	5280	2/24/87	109	38.2	28.1	37.5
MIRROR LAKE PILLOW	5600	3/01/87	---	30.5S	29.9	27.9
PARK CK RIDGE PILLOW	4600	3/01/87	---	38.7E	41.4	39.9
RAINY PASS PILLOW	4780	3/01/87	---	30.3E	32.1	41.7
ENTIAT RIVER						
BRIEF	1600	2/27/87	17	6.7	8.4	6.9
20A36 IS NOT ON FILE						
POPE RIDGE	3540	2/27/87	50	17.0	16.7	17.1
20A32 IS NOT ON FILE						
20A37 IS NOT ON FILE						
20A35 IS NOT ON FILE						
20B21 IS NOT ON FILE						
WENATCHEE RIVER						
BERNE-MILL CREEK	3170	2/27/87	63	22.9	22.3	24.8
BLEWETT PASS#2PILLOW	4270	3/01/87	---	15.9S	16.6	22.2
CHIWAUKUM G.S.	2500	2/27/87	27	10.2	10.7	11.0
LYMAN LAKE PILLOW	5900	3/01/87	---	48.2S	44.3	55.9
MERRITT	2140	2/27/87	33	13.6	14.2	14.7
MISSION RIDGE	5000	2/25/87	41	11.1	15.6	--
STEVENS PASS PILLOW	4070	3/01/87	---	40.4S	33.7	37.8
STEVENS PASS SAMO SO	3700	2/27/87	78	27.6	24.7	31.9
COLOCKUM CREEK						
TROUGH #2 PILLOW	5310	3/01/87	---	7.4E	7.2	11.0
SQUILCHUCK CREEK						
BEEHIVE SPRINGS	4400	2/25/87	25	6.5	9.0	7.8
STEMILT CREEK						
STEMILT SLIDE	5000	2/25/87	33	9.7	13.1	13.1
UPPER WHEELER	4400	2/25/87	28	8.3	11.6	9.6
YAKIMA RIVER						
ANTANUM R.S.	3100	2/25/87	24	7.0	9.5	6.9
BIG BOULDER CREEK	3200	2/24/87	51	15.9	--	18.1
BLEWETT PASS#2PILLOW	4270	3/01/87	---	15.9S	16.6	22.2
BUMPING LAKE	3450	2/26/87	38	12.5	16.0	17.2
BUMPING LAKE (NEW)	3400	2/26/87	44	14.1	18.5	18.1
CAYUSE PASS	5300	3/01/87	---	56.7E	49.1	67.0
COLOCKUM PASS	5370	2/25/87	39	11.0	21.4	14.7
CORRAL PASS PILLOW	6000	3/01/87	---	32.1S	28.7	32.1
FISH LAKE PILLOW	3370	3/01/87	---	25.3E	24.7	32.8
GREEN LAKE PILLOW	6000	3/01/87	---	17.3E	16.4	18.1
GROUSE CAMP PILLOW	5380	3/01/87	---	18.4S	18.7	16.6
LAKE CLE ELUM	2200	2/24/87	20	5.0	10.5	8.1
NORSE LAKE PILLOW	5400	3/01/87	---	42.3E	39.3	44.0
OLALLIE MEADOWS	3630	2/24/87	70	26.9	21.0	39.3
STANPEDE PASS PILLOW	3860	3/01/87	---	37.7E	29.4	47.7
SASSE RIDGE PILLOW	4200	3/01/87	---	25.9S	15.2	30.7
TUMMEL AVENUE	2450	2/23/87	43	15.7	14.2	19.8
WHITE PASS ES PILLOW	4500	3/01/87	---	14.1S	19.4	22.0
ANTANUM CREEK						
ANTANUM R.S.	3100	2/25/87	24	7.0	9.5	6.9
GREEN LAKE PILLOW	6000	3/01/87	---	17.3E	16.4	18.1
MILL CREEK						
HIGH RIDGE PILLOW	4980	3/01/87	---	19.0S	16.4	26.1
TOUCHET #2 PILLOW	5530	3/01/87	---	26.4	24.4	--
LEWIS AND COWLITZ RIVERS						
CAYUSE PASS	5300	3/01/87	---	56.7E	49.1	67.0
WHITE PASS ES PILLOW	4500	3/01/87	---	16.1S	19.4	22.0
WHITE RIVER						
CAYUSE PASS	5300	3/01/87	---	56.7E	49.1	67.0
CORRAL PASS	6000	2/24/87	86	28.9	--	34.1
CORRAL PASS PILLOW	6000	3/01/87	---	32.1S	28.7	32.1
NORSE LAKE PILLOW	5400	3/01/87	---	42.3E	39.3	44.0
GREEN RIVER						
COUGAR MTN. PILLOW	3200	3/01/87	---	18.4S	12.4	24.7
GRASS MOUNTAIN #2	2900	3/06/87	20	7.8	--	14.6
LESTER CREEK	3100	3/06/87	49	16.4	.0	19.1
LYNN LAKE	4000	3/06/87	38	15.3	10.5	22.8
SAWMILL RIDGE	4700	3/06/87	65	25.0	16.4	30.5
STANPEDE PASS PILLOW	3860	3/01/87	---	37.7E	29.4	47.7
TWIN CAMP	4100	3/06/87	55	34.3	16.1	21.1
CEDAR RIVER						
CITY CABIN	2390	2/24/87	0	.0	5.0	13.1
MT. GARDNER	3300	2/24/87	26	10.8	8.0	14.8
SNOQUALMIE RIVER						
OLALLIE MEADOWS	3630	2/24/87	70	26.9	21.0	39.3
SKYKOMISH RIVER						
STEVENS PASS PILLOW	4070	3/01/87	---	40.4S	33.7	37.8
STEVENS PASS SAMO SO	3700	2/27/87	78	27.6	24.7	31.9
SKAGIT RIVER						
BEAVER CREEK TRAIL	2200	2/27/87	35	12.1	13.3	13.0
BEAVER PASS	3680	2/26/87	62	25.1	24.4	25.5
BROWN TOP AM	6000	2/26/87	130	48.6	54.2	52.9
DEVILS PARK	5900	2/26/87	90	31.0	37.6	37.8
FREEZEOUT CK. TRAIL	3500	2/27/87	39	11.3	10.2	11.3
GRANITE CREEK	3500	2/27/87	48	14.2	12.6	16.3
HARTS PASS PILLOW	6500	3/01/87	---	35.7S	37.5	47.1
KLESILKWA CAN.	3710	2/23/87	29	8.8	7.3	11.4
LIGHTNING LAKE CAM.	4000	2/23/87	37	10.9	8.7	11.9
LYMAN LAKE PILLOW	5900	3/01/87	---	48.2S	44.3	55.9
MEADOWS CABIN	1900	2/26/87	6	1.4	4.4	6.4
NEW HOZOMEEN LAKE	2800	2/26/87	33	7.8	9.8	11.7
RAINY PASS PILLOW	4780	3/01/87	---	30.3E	32.1	41.7
THUNDER BASIN	2400	2/26/87	53	18.0	14.7	18.9
BAKER RIVER						
DOCK BUTTE AM	3800	2/23/87	98	42.1	34.6	57.7
EASY PASS AM	5200	2/23/87	140	58.8	49.5	65.3
JASPER PASS AM	5400	2/23/87	158	63.2	56.8	77.1
MARTEN LAKE AM	3600	2/23/87	124	54.6	43.0	65.4
MT. BLUM AM	5800	2/23/87	112	44.8	43.7	57.3
ROCKY CREEK AM	2100	2/23/87	34	13.6	17.6	26.1
SCHREIBERS MOW AM	3400	2/23/87	92	40.5	30.8	49.7
SF THUNDER CK AM	2200	2/23/87	0	.0	.0	9.0
DUNGENESS RIVER						
DEER PARK	5200	2/24/87	47	14.8	11.1	17.9
HORSE CREEK						
COX VALLEY	4500	2/27/87	84	32.0	26.8	32.9
ELWHA RIVER						
HURRICANE	4500	/32/87	48	15.6	9.5	17.9

RANCHING TIPS FOR WATER-SHORT YEARS

Forage production on range and dry pasture depends entirely on natural moisture. While overgrazing does damage to perennial plants during a season of normal moisture, it is more severe during a drought year. It reduces plant vigor, stops root and leaf growth, reduces ground cover, and invites accelerated erosion. Once erosion begins, it gets worse each year, further reducing plant vigor and forage production. This process is difficult to reverse.

Rather than risk permanent damage to grazing resources start planning a strategy early. For example:

- reduce livestock numbers to balance with forage supply
- cull herds more than normal
- sell calves and lambs early

determine forage needs and buy needed supplements early

- grow small grains or sorghums for hay or pasture (these use less water than conventional forage crops)
- defer planting perennial pasture, hay or range seedings until a year with more favorable water outlook
- keep spring developments, stock tanks, float valves and pipeline in good working order so water is not wasted
- use evaporation retardant on ponds and tanks
- prepare for hauling stock water
- give spring development high priority (even mediocre springs will be helpful)
- check with local SCS and ASCS offices to learn if cost-share programs are available to help with spring developments or other water conservation practices
- don't overgraze or otherwise disturb streambank vegetation (it will help prevent erosion, reduce sediment, and provide food and cover for wildlife)

Remember, if a unit must be abused, well-established seedings can tolerate overgrazing better than native range.

Wildlife will suffer during a drought as much or more than domestic livestock. The wildlife that share your land is a valuable natural resource.

To help wildlife:

- include features at stock water developments which will allow small animals and birds safe access to water (these are usually not expensive and are easily installed)
- fence ponds and springs and install collector pipes to deliver water to a tank or trough. This will improve water quality and quantity for livestock, as well as provide lush vegetation for small animals and birds.

Other places for information or assistance:

- check with local ASCS office for possible special practices or cost-sharing that might assist with irrigation on your farm or ranch this year.

- maintain contact with Farmers Home Administration for special local programs available.

- maintain contact with the local Cooperative Extension Service office for agricultural and marketing conditions.

If you belong to an irrigation district, contact irrigation officials throughout the season to learn about current water availability and water supply forecasts.

For more information concerning your crop, and soil and water conditions, contact the local Conservation District Office.

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canada:

Ministry of the Environment, Water
Investigations Branch, Victoria, British Columbia

States:

Washington State Department of Ecology
Washington State Department of Natural Resources

Federal:

Department of the Army
- Corps of Engineers

U.S. Department of Agriculture
- Forest Service

U.S. Department of Commerce
- NOAA, National Weather Service

U.S. Department of the Interior
- Bonneville Power Administration
- Bureau of Reclamation
- Geological Survey
- National Park Service
- Bureau of Indian Affairs

Local:

City of Tacoma
City of Seattle
Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company
Snohomish County P.U.D.
Colville Confederated Tribes

Private:

Okanogan Irrigation District
Wenatchee Heights Irrigation District
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 360, U.S. COURT HOUSE
SPOKANE, WASHINGTON 99201

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
SPOKANE, WA
PERMIT NO G-267

THIRD CLASS MAIL

UNIVERSITY OF ILLINOIS
DOCUMENTS LIBRARY-200D LIBRARY
1408 W. GREGORY DRIVE
URBANA IL 61801

Washington
Water Supply Outlook

and

Federal — State — Private
Cooperative Snow Surveys

SOIL CONSERVATION SERVICE

☆ U.S. GOVERNMENT PRINTING OFFICE: 1987—791-072-60001

1985

UNIVERSITY OF ILLINOIS-URBANA
3 0112 084234688